5 Interface Management Commands

About This Chapter

NOTE

Async interface,Serial interface, PON interface, POS interface, CPOS interface, E&M interface, ADSL interface, VDSL interface, G.SHDSL interface, IMA interface, ISDN BRI interface, 3G/LTE Cellular interface, CE1/PRI interface, CT1/PRI interface, E1-F interface, T1-F interface, and CE3 interface demand for related cards. For the mapping between the device and interface card, see Huawei AR Series Access Routers Get to Know the Product-Hardware Description-Cards.

5.1 Basic Interface Configuration Commands
5.2 Ethernet Interface Configuration Commands
5.3 Serial Interface Configuration Commands
5.4 Async Interface Configuration Commands
5.5 CE1/PRI Interface Configuration Commands
5.6 CT1/PRI Interface Configuration Commands
5.7 CE3 Interface Configuration Commands
5.8 E1-F Interface Configuration Commands
5.9 T1-F Interface Configuration Commands
5.10 E&M Interface Configuration Commands
5.11 Cellular Interface Configuration Commands
5.12 ISDN BRI Interface Configuration Commands
5.13 POS Interface Commands
5.14 CPOS Interface Configuration Commands
5.15 ADSL Interface Configuration Commands
5.16 VDSL Interface Configuration Commands
5.17 G.SHDSL Interface Configuration Commands

 Copyright © Huawei Technologies Co., Ltd.

5.18 IMA Commands

5.19 PON Interface Configuration Commands

5.20 Logical Interface Configuration Commands

5.21 transparent transmission commands

5.1 Basic Interface Configuration Commands

5.1.1 bandwidth (Interface view)

Function

The **bandwidth** command sets the interface bandwidth obtained by the NMS from the MIB.

The **undo bandwidth** command restores the default configuration.

By default, the interface bandwidth obtained by the NMS from the MIB depends on the interface type. For example, the bandwidth of a GE interface is 1000 Mbit/s.

Format

bandwidth *bandwidth* [**kbps**]

undo bandwidth

Parameters

Parameter	Description	Value
bandwidth	Specifies the bandwidth of an interface.	The value is an integer ranging from 1 to 1000000, and the default unit is Mbit/s.
kbps	Indicates the unit of an interface bandwidth is kbit/s. If **kbps** is not specified, the unit of an interface bandwidth is Mbit/s.	-

Views

Interface view

Default Level

2: Configuration level

 Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

The bandwidth command mainly ensures that the network management station (NMS) can acquire the bandwidth of an interface. The NMS can check the interface bandwidth through the two objects **ifSpeed** and **ifHighSpeed** in **IF-MIB**.

- If the configured bandwidth is smaller than 4000 Mbit/s, **ifSpeed** and **ifHighSpeed** are respectively displayed as *bandwidth* x 1000 x 1000 and *bandwidth*.
- If the configured bandwidth is equal to or larger than 4000 Mbit/s, **ifSpeed** and **ifHighSpeed** are respectively displayed as 4294967295 (0XFFFFFFFF) and *bandwidth*.

Example

Set the bandwidth of Eth1/0/0 to 100 Mbit/s.

```
<Huawei> system-view
[Huawei] interface ethernet 1/0/0
[Huawei-Ethernet1/0/0] bandwidth 100
```

5.1.2 description (interface view)

Function

The **description** command configures the description for an interface.

The **undo description** command restores the default description of an interface.

By default, the description of an interface is "HUAWEI, AR Series, *interface-type interface-number* Interface".

Format

description *description*

undo description

Parameters

Parameter	Description	Value
description	Specifies the interface description.	The value is a string of 1 to 242 characters. The character string is case sensitive. It can contain blanks but cannot contain the question mark (?).

Views

Interface view

Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

To facilitate device management and maintenance, you can configure descriptions for interfaces. An interface description can contain the device where the interface is located, interface type, and remote device. For example: To-[DeviceB]Eth-2/0/0 indicates that an interface of this device is connected to Eth2/0/0 of device B.

Precautions

The interface description is displayed from the first non-space character.

Example

Configure the description of Eth2/0/0 as To-[DeviceB]Eth-2/0/0, indicating that this device is connected to device B through Eth2/0/0.

```
<Huawei> system-view
[Huawei] interface ethernet 2/0/0
[Huawei-Ethernet2/0/0] description To-[DeviceB]Eth-2/0/0
```

Related Topics

5.1.6 display interface description

5.1.3 display default-parameter interface

Function

The **display default-parameter interface** command displays the default interface configuration.

Format

display default-parameter interface *interface-type interface-number* [*.subinterface-number*]

Parameters

Parameter	Description	Value
interface-type interface-number	Displays the default configuration of a specified interface.	-
subinterface-number	Displays the running status of a sub-interface.	The value is an integer that ranges from 1 to 4096.

Copyright © Huawei Technologies Co., Ltd.

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

Default configurations are not saved in the configuration file. To check the default configuration of an interface, run the **display default-parameter interface** command on the interface.

The displayed information varies according to interfaces.

Example

Display the default configuration of GE1/0/0.1.

```
<Huawei> display default-parameter interface gigabitethernet 1/0/0.1
 Interface state: undo shutdown
 MTU: 1500
 Flow-stat interval: 300s
 Trap-threshold: input-rate 100, output-rate 100
 Snmp trap updown: enable
 Description: HUAWEI, AR Series, GigabitEthernet1/0/0.1 Interface
```

Table 5-1 Description of the **display default-parameter interface gigabitethernet** command output

Item	Description
Interface state:	Default status of an interface: • shutdown • undo shutdown To change the interface status, run the **shutdown** command or the **undo shutdown** command in the interface view.
MTU:	Default MTU value of the interface. To set the MTU value for an interface, run the **mtu** command in the interface view.
Flow-stat interval:	Interval for collecting traffic statistics on the interface. To set the interval for collecting traffic statistics on an interface, run the **set flow-stat interval** command in the interface view.
Trap-threshold:	Alarm threshold for outbound and inbound bandwidth usage on the interface. To set the alarm threshold for outbound and inbound bandwidth usage on an interface, run the **trap-threshold** command in the interface view.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Snmp trap updown:	Whether an alarm is sent to the NMS when the interface status changes: • disable: No alarm is sent to the NMS when the interface status changes. • enable: An alarm is sent to the NMS when the interface status changes. To configure an interface to send an alarm to the NMS when the interface status changes, run the **enable snmp trap updown** command in the interface view.
Description:	Interface description. To configure the description for an interface, run the **5.1.2 description (interface view)** command in the interface view.

Display the default configuration of Dialer1.

```
<Huawei> display default-parameter interface dialer 1
 MTU: 1500
 Timer hold: 10s
 Flow-stat interval: 300s
 Description: HUAWEI, AR Series, Dialer1 Interface
```

Table 5-2 Description of the **display default-parameter interface dialer** command output

Item	Description
MTU:	Default MTU value of the interface. To set the MTU value for an interface, run the **mtu** command in the interface view.
Timer hold:	Polling interval of the link layer protocol applied to the interface. To set the polling interval for an interface, run the **timer hold** command in the interface view.
Flow-stat interval:	Interval for collecting traffic statistics on the interface. To set the interval for collecting traffic statistics on an interface, run the **set flow-stat interval** command in the interface view.
Description:	Interface description. To configure the description for an interface, run the **5.1.2 description (interface view)** command in the interface view.

Copyright © Huawei Technologies Co., Ltd.

5.1.4 display interface

Function

The **display interface** command displays the interface running status and statistics.

Format

display interface [*interface-type* [*interface-number* [.*subinterface-number*] | **main**] | **main**]

display interface slot *slot-id* [**main**]

Parameters

Parameter	Description	Value
interface-type [*interface-number*]	Displays the running status of an interface. • *interface-type* specifies the interface type. • *interface-number* specifies the interface number. If the interface type is specified but no interface number is specified, the running status of all the interfaces of this type is displayed.	-
subinterface-number	Displays the running status of a sub-interface.	The value is an integer that ranges from 1 to 4096.

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
main	Displays running status and traffic statistics about an interface. • If an interface has no sub-interfaces, status and traffic statistics about the interface are displayed whether you specify the **main** parameter or not. • If an interface has sub-interfaces, status and traffic statistics about the interface and sub-interfaces are displayed if you do not specify the **main** parameter.	-
slot *slot-id*	Specifies the slot ID.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

Usage Scenario

The running status and statistics of an interface includes the physical status, basic configuration, and packet forwarding of the interface. You can use the **display interface** command to collect traffic statistics or locate faults on an interface.

Precautions

If no interface type is specified, the running status and statistics of all the interfaces is displayed. If the interface type is specified but no interface number is specified, the running status of all the interfaces of this type is displayed.

Example

Display the running status, basic configuration, and packet forwarding on Layer 2 Ethernet interface Ethernet2/0/0.

```
<Huawei> display interface ethernet 2/0/0
Ethernet2/0/0 current state : UP
Line protocol current state : UP
```

 Copyright © Huawei Technologies Co., Ltd.

```
Description:HUAWEI, AR Series, Ethernet2/0/0 Interface
Switch Port, PVID :    1, TPID : 8100(Hex), The Maximum Frame Length is 9216
IP Sending Frames' Format is PKTFMT_ETHNT_2, Hardware address is 0018-2000-0083
Last physical up time   : 2010-07-21 15:35:37
Last physical down time : 2010-07-20 01:06:25
Current system time: 2010-07-21 16:07:53-05:13
Port Mode: COMMON COPPER
Speed :  100,  Loopback: NONE
Duplex: FULL,  Negotiation: ENABLE
Mdi   : AUTO,  Clock   : -
Last 300 seconds input rate 0 bits/sec, 0 packets/sec
Last 300 seconds output rate 0 bits/sec, 0 packets/sec
Input peak rate 0 bits/sec,Record time: -
Output peak rate 0 bits/sec,Record time: -

Input:  126 packets, 34204 bytes
  Unicast:              0,  Multicast:              52
  Broadcast:           74,  Jumbo:                   0
  Discard:              0,  Total Error:             0

  CRC:                  0,  Giants:                  0
  Jabbers:              0,  Throttles:               0
  Runts:                0,  Symbols:                 0
  Ignoreds:             0,  Frames:                  0

Output:  2398 packets, 799486 bytes
  Unicast:              0,  Multicast:            1461
  Broadcast:         1477,  Jumbo:                   0
  Discard:              0,  Total Error:            53

  Collisions:          32,  ExcessiveCollisions:    21
  Late Collisions:      0,  Deferreds:               0

    Input bandwidth utilization threshold : 100.00%
    Output bandwidth utilization threshold: 100.00%
    Input bandwidth utilization  :    0%
    Output bandwidth utilization :    0%
```

Table 5-3 Description of the **display interface** command output

Item	Description
current state	Current interface status: • DOWN: indicates that the interface is disabled. • UP: indicates that the interface is enabled.
Line protocol current state	Link layer protocol status of the interface: • DOWN: indicates that the link layer protocol of the interface fails or no IP address is assigned to the interface. • UP: indicates that the link layer protocol of the interface is running properly.
Description	Interface description. To configure the description for an interface, run the **description** command.
PVID	Default VLAN ID of the interface.
The Maximum Frame Length	Maximum frame length allowed by the interface.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
IP Sending Frames' Format	Format of the frame contained in the sent IP packet, which can be PKTFMT_ETHNT_2, Ethernet_802.3, or Ethernet_SNAP.
Hardware address	MAC address of the device.
Last physical up time	Last time the interface goes Up physically. If this field displays "-", the physical status of the interface does not change.
Last physical down time	Last time the interface goes Down physically. If this field displays "-", the physical status of the interface does not change.
Current system time	Current system time. If the time zone is configured and the daylight saving time is used, the time is in YYYY/MM/DD HH: MM: SS UTC±HH: MM DST format.
Port Mode	Working mode of the common interface: • COMMON COPPER: The interface is an electrical interface. • COMMON FIBER: The interface is an optical interface. Run **combo-port**. The working mode of the combo interface is configured. • AUTO: The combo interface automatically select the working mode. • AUTO FIBER: The combo interface automatically select optical working mode. • AUTO COPPER: The combo interface automatically select electrical working mode. • FORCE FIBER: The combo interface is configured as an optical interface. • FORCE COPPER: The combo interface is configured as an electrical interface.
Speed	Current rate of the interface. • In auto-negotiation mode, the **auto speed** command configures the rate of an interface. • In non-auto negotiation mode, the **speed** command configures the rate of an interface.
Loopback	Loopback configuration of the interface. The **loopback** command configures loopback on an interface.
Duplex	Duplex mode of the interface.
Negotiation	Auto-negotiation mode of the interface.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
Mdi	Network cable type of the interface.
Clock	Clock mode of the combo interface.
Last 300 seconds input rate	Incoming packet rate (bits per second and packets per second) within the last 300 seconds.
Last 300 seconds output rate	Outgoing packet rate (bits per second and packets per second) within the last 300 seconds.
Input peak rate	Maximum incoming packet rate.
Output peak rate	Maximum outgoing packet rate.
Input	Total number of received packets.
Output	Total number of sent packets.
Unicast	Number of unicast packets received or sent by the interface.
Multicast	Number of multicast packets received or sent by the interface.
Broadcast	Number of broadcast packets received or sent by the interface.
Jumbo	Number of jumbo frames received or sent by the interface.
Discard	Number of packets discarded by the interface during physical layer detection. These packets are discarded because the interface is congested. The device does not support the **Discard** field for Layer 2 Ethernet interfaces.
Total Error	Number of error packets found during physical layer detection.
CRC	Number of CRC error packets received by the interface.
Giants	Number of jumbo frames with correct Frame Check Sequence (FCS) received by the interface. **NOTE** For the AR109, AR109W, AR109GW-L, AR121, AR121W, AR121GW-L, AR129, AR129W, AR129CVW, AR129CV, AR129GW-L, AR129CGVW-L, AR161, AR161W, AR161EW, AR161EW-M1, AR161G-L, AR161G-Lc, AR161G-U, AR169, AR169W, AR169EW, AR169CVW, AR169EGW-L, AR169CVW-4B4S, AR169G-L, AR169-P-M9, AR169W-P-M9, AR169RW-P-M9, this item indicates the number of received packets with length exceeding the maximum jumbo frame size.
Jabbers	Number of jumbo frames with incorrect FCS received by the interface.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Throttles	Number of undersized frames with incorrect FCS received by the interface. Undersized frames are the frames that are shorter than 64 bytes and have the correct format and valid CRC field.
Runts	Number of undersized frames with correct FCS values received by the interface. Undersized frames are the frames that are shorter than 64 bytes and have the correct format and valid CRC field.
Symbols	Number of received frames with coding errors.
Ignoreds	Number of received MAC control frames with OpCode not being PAUSE.
Frames	Number of packets with incorrect 802.3 length.
Collisions	Number of frames that the interface stops sending when conflicts are detected during transmission.
ExcessiveCollisions	Number of frames that experience more than 16 consecutive conflict events and fail to be sent.
Late Collisions	Number of frames that experience conflict events and are delayed. The first 512 bits of these frames have been sent but these frames are delay because conflicts are detected.
Deferreds	Number of packets delayed because conflicts are detected before transmission.
Input bandwidth utilization threshold	Threshold for inbound bandwidth usage.
Output bandwidth utilization threshold	Threshold for outbound bandwidth usage.
Input bandwidth utilization	Inbound bandwidth usage. This parameter is not collected on interfaces that do not support statistics collection, and the value is fixed at 0% or --.
Output bandwidth utilization	Outbound bandwidth usage. This parameter is not collected on interfaces that do not support statistics collection, and the value is fixed at 0% or --.

Display the running status, basic configuration, and packet forwarding on Layer 3 Ethernet interface Ethernet2/0/0.

```
<Huawei> display interface ethernet 2/0/0
Ethernet2/0/0 current state : UP
Line protocol current state : UP
Description:HUAWEI, AR Series, Ethernet2/0/0 Interface
Route Port,The Maximum Transmit Unit is 1500
Internet Address is 192.168.4.2/24
IP Sending Frames' Format is PKTFMT_ETHNT_2, Hardware address is 0018-2000-0083
```

 Copyright © Huawei Technologies Co., Ltd.

```
Last physical up time   : 2010-09-08 15:35:37
Last physical down time : 2010-09-08 01:06:25
Current system time: 2010-10-21 16:07:53
Port Mode: COMMON COPPER
Speed :  100,  Loopback: NONE
Duplex: FULL,  Negotiation: ENABLE
Mdi   : AUTO,  Clock   : -
Last 300 seconds input rate 0 bits/sec, 0 packets/sec
Last 300 seconds output rate 0 bits/sec, 0 packets/sec
Input peak rate 0 bits/sec,Record time: -
Output peak rate 0 bits/sec,Record time: -

Input:  126 packets, 34204 bytes
  Unicast:              0,  Multicast:             52
  Broadcast:           74,  Jumbo:                  0
  Discard:              0,  Total Error:            0

  CRC:                  0,  Giants:                 0
  Jabbers:              0,  Throttles:              0
  Runs:                 0,  Symbols:                0
  Ignoreds:             0,  Frames:                 0

Output:  2398 packets, 799486 bytes
  Unicast:              0,  Multicast:          1461
  Broadcast:         1477,  Jumbo:                 0
  Discard:              0,  Total Error:           53

  Collisions:          32,  ExcessiveCollisions:    21
  Late Collisions:      0,  Deferreds:              0

    Input bandwidth utilization threshold : 100.00%
    Output bandwidth utilization threshold: 100.00%
    Input bandwidth utilization  :    0%
    Output bandwidth utilization :    0%
```

Table 5-4 Description of the **display interface** command output

Item	Description
current state	Current interface status: • DOWN: indicates that the interface is disabled. • UP: indicates that the interface is enabled.
Line protocol current state	Link layer protocol status of the interface: • DOWN: indicates that the link layer protocol of the interface fails or no IP address is assigned to the interface. • UP: indicates that the link layer protocol of the interface is running properly.
Description	Interface description. To configure the description for an interface, run the **description** command.
The Maximum Transmit Unit is	MTU of the interface. For example, the default MTU of an Ethernet interface is 1500 bytes. Packets whose size is greater than the MTU are fragmented before being transmitted. If fragmentation is not allowed, the packets are discarded.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Internet Address is	IP address and mask length of the interface. The displayed information varies according to the IP address allocation mode: • If the IP address is manually configured, the information is displayed as "Internet Address is 192.168.4.2/24." • If the IP address is obtained using DHCP, the information is displayed as "Internet Address is allocated by DHCP, 192.168.4.2/24."
IP Sending Frames' Format	Format of the frame contained in the sent IP packet, which can be PKTFMT_ETHNT_2, Ethernet_802.3, or Ethernet_SNAP.
Hardware address	MAC address of the device.
Last physical up time	Last time the interface goes Up physically. If this field displays "-", the physical status of the interface does not change.
Last physical down time	Last time the interface goes Down physically. If this field displays "-", the physical status of the interface does not change.
Current system time	Current system time. If the time zone is configured and the daylight saving time is used, the time is in YYYY/MM/DD HH: MM: SS UTC±HH: MM DST format.
Port Mode	Working mode of the interface: • COMMON COPPER: The interface works as an electrical interface. • COMMON FIBER: The interface works as an optical interface. If the interface is a combo interface: • COMBO AUTO: The combo interface automatically selects the working mode. • FORCE FIBER: The combo interface is configured as an optical interface. • FORCE COPPER: The combo interface is configured as an electrical interface. To configure the working mode for an interface, run the **combo-port** command.
Speed	Current rate of the interface. • In auto-negotiation mode, the **auto speed** command configures the rate of an interface. • In non-auto negotiation mode, the **speed** command configures the rate of an interface.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Loopback	Loopback configuration of the interface. To configure loopback on an interface, run the **loopback** command.
Duplex	Duplex mode of the interface.
Negotiation	Auto-negotiation mode of the interface.
Mdi	Network cable type of the interface.
Clock	Clock mode of the combo interface.
Last 300 seconds input rate	Incoming packet rate (bits per second and packets per second) within the last 300 seconds.
Last 300 seconds output rate	Outgoing packet rate (bits per second and packets per second) within the last 300 seconds.
Input peak rate	Maximum incoming packet rate.
Output peak rate	Maximum outgoing packet rate.
Input	Total number of received packets.
Output	Total number of sent packets.
Unicast	Number of unicast packets received or sent by the interface.
Multicast	Number of multicast packets received or sent by the interface.
Broadcast	Number of broadcast packets received or sent by the interface.
Jumbo	Number of jumbo frames received or sent by the interface. If the value is -, the number of jumbo frames cannot be collected on the device. **NOTE** Only interfaces of AR2220 MPUs support this statistical item.
Discard	Number of packets discarded by the interface during physical layer detection. These packets are discarded because the interface is congested. **NOTE** Only Layer 3 Ethernet interfaces of AR201, AR1220 and AR2220 MPUs support this statistical item.
Total Error	Number of error packets found during physical layer detection.
CRC	Number of CRC error packets received by the interface.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
Giants	Number of jumbo frames with correct FCS received by the interface. **NOTE** For the AR109, AR109W, AR109GW-L, AR121, AR121W, AR121GW-L, AR129, AR129W, AR129CVW, AR129CV, AR129GW-L, AR129CGVW-L, AR161, AR161W, AR161EW, AR161EW-M1, AR161G-L, AR161G-Lc, AR161G-U, AR169, AR169W, AR169EW, AR169CVW, AR169EGW-L, AR169CVW-4B4S, AR169G-L, AR169-P-M9, AR169W-P-M9, AR169RW-P-M9, this item indicates the number of received packets with length exceeding the maximum jumbo frame size.
Jabbers	Number of jumbo frames with incorrect FCS received by the interface.
Throttles	Number of undersized frames with incorrect FCS received by the interface. Undersized frames are the frames that are shorter than 64 bytes and have the correct format and valid CRC field.
Runts	Number of undersized frames with correct FCS values received by the interface. Undersized frames are the frames that are shorter than 64 bytes and have the correct format and valid CRC field.
Symbols	Number of received frames with coding errors.
Ignoreds	Number of received MAC control frames with OpCode not being PAUSE.
Frames	Number of packets with incorrect 802.3 length.
Collisions	Number of frames that the interface stops sending when conflicts are detected during transmission.
ExcessiveCollisions	Number of frames that experience more than 16 consecutive conflict events and fail to be sent.
Late Collisions	Number of frames that experience conflict events and are delayed. The first 512 bits of these frames have been sent but these frames are delay because conflicts are detected.
Deferreds	Number of packets delayed because conflicts are detected before transmission.
Input bandwidth utilization threshold	Threshold for inbound bandwidth usage.
Output bandwidth utilization threshold	Threshold for outbound bandwidth usage.
Input bandwidth utilization	Inbound bandwidth usage. This parameter is not collected on interfaces that do not support statistics collection, and the value is fixed at 0% or --.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
Output bandwidth utilization	Outbound bandwidth usage. This parameter is not collected on interfaces that do not support statistics collection, and the value is fixed at 0% or --.

Display the packet forwarding on dialer1 interface.

```
<Huawei> display interface dialer 1
Dialer1 current state : UP
Line protocol current state : UP (spoofing)
Description:HUAWEI, AR Series, Dialer1 Interface
Route Port,The Maximum Transmit Unit is 1500, Hold timer is 0(sec)
Internet protocol processing : disabled
Link layer protocol is PPP
LCP initial
Physical is Dialer
Current system time: 2017-12-08 23:02:15
    Input: 8837 packets, 851857 bytes
    Output: 0 packets, 0 bytes
Last 600 seconds input rate 11358 bits/sec, 14 packets/sec
Last 600 seconds output rate 0 bits/sec, 0 packets/sec
Input peak rate 65350 bits/sec,Record time: 2017-12-06 04:16:23
Output peak rate 0 bits/sec,Record time: -


ipv4
    Input: 8837 packets, 851857 bytes
    Output: 0 packets, 0 bytes
Last 600 seconds input rate 0 bits/sec, 0 packets/sec
Last 600 seconds output rate 0 bits/sec, 0 packets/sec
Input peak rate 65350 bits/sec,Record time: 2017-12-06 04:16:23
Output peak rate 0 bits/sec,Record time: -


ipv6
    Input: 0 packets, 0 bytes
    Output: 0 packets, 0 bytes
Last 600 seconds input rate 30744573456171227 bits/sec, 30744573456182571 packet
s/sec
Last 600 seconds output rate 0 bits/sec, 0 packets/sec
Input peak rate 0 bits/sec,Record time: -
Output peak rate 0 bits/sec,Record time: -

    Input bandwidth utilization  :    0%
    Output bandwidth utilization :    0%
```

Table 5-5 Description of the **display interface** command output

Item	Description
current state	Current interface status: • DOWN: indicates that the interface is disabled. • UP: indicates that the interface is enabled.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Line protocol current state	Link layer protocol status of the interface. • DOWN: indicates that the link layer protocol of the interface fails or no IP address is assigned to the interface. • UP: indicates that the link layer protocol of the interface is running properly.
Description	Interface description. To configure the description for an interface, run the **description** command.
The Maximum Transmit Unit is	MTU of the interface. For example, the default MTU of an Ethernet interface is 1500 bytes. Packets whose size is greater than the MTU are fragmented before being transmitted. If fragmentation is not allowed, the packets are discarded.
Internet Address is	IP address and mask length of the interface. The displayed information varies according to the IP address allocation mode: • For a statically configured IP address: Internet Address is 192.168.4.2/24 If the IP address is statically configured, the information is displayed as "Internet Address is 192.168.4.2/24". • If the IP address is obtained using DHCP, the information is displayed as "Internet Address is allocated by DHCP, 192.168.4.2/24".
IP Sending Frames' Format	Format of frames sent by the IP protocol, including PKTFMT_ETHNT_2, Ethernet_802.3, and Ethernet_SNAP.
Hardware address	MAC address of the device.
Input	Total number of received packets.
Output	Total number of sent packets.
Last 600 seconds input rate	Incoming packet rate (bits per second and packets per second) within the last 600 seconds.
Last 600 seconds output rate	Outgoing packet rate (bits per second and packets per second) within the last 600 seconds.
Input peak rate	Maximum incoming packet rate.
Output peak rate	Maximum outgoing packet rate.
ipv4	Number of IPv4 packets.
ipv6	Number of IPv6 packets.
Input bandwidth utilization	Inbound bandwidth usage. This parameter is not collected on interfaces that do not support statistics collection, and the value is fixed at 0% or --.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
Output bandwidth utilization	Outbound bandwidth usage. This parameter is not collected on interfaces that do not support statistics collection, and the value is fixed at 0% or --.

Related Topics

5.1.2 description (interface view)
5.1.16 shutdown (interface view)

5.1.5 display interface brief

Function

The **display interface brief** command displays brief information about the status and configuration of interfaces.

Format

display interface brief [**main**]

Parameters

Parameter	Description	Value
main	Displays brief information about an Ethernet main interface.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

Usage Scenario

The **display interface brief** command displays brief information about interfaces, including the physical status, link layer protocol status, inbound and outbound bandwidth usage within a certain period, and numbers of sent and received error packets. This information helps locate faults on interfaces.

Precautions

To clear statistics on an interface, run the **reset counters interface** command.

Copyright © Huawei Technologies Co., Ltd.

Example

Display brief information about the status and configuration of interfaces.

```
<Huawei> display interface brief
PHY: Physical
*down: administratively down
(l): loopback
(s): spoofing
(b): BFD down
^down: standby
(e): ETHOAM down
InUti/OutUti: input utility/output utility
Interface                   PHY   Protocol InUti OutUti   inErrors  outErrors
Dialer1                     up    up(s)     0%     0%          0          0
Eth-Trunk18                 down  down      0%     0%          0          0
Ethernet1/0/0               up    up        0.01%  0.01%       0          0
Ethernet1/0/1               down  down      0%     0%          0          0
GigabitEthernet0/0/0        up    up        0.01%  0.01%       0          0
GigabitEthernet0/0/1        *down down      0%     0%          0          0
GigabitEthernet0/0/1.1      down  down      0%     0%          0          0
LoopBack0                   up    up(s)     0%     0%          0          0
NULL0                       up    up(s)     0%     0%          0          0
Tunnel0/0/0                 up    down      --     --          0          0
Tunnel0/0/1                 up    down      --     --          0          0
Virtual-Ethernet0/0/0       down  down      0%     0%          0          0
Virtual-Template0           up    down      0%     0%          0          0
Virtual-Template1           up    down      0%     0%          0          0
Virtual-Template2           up    down      0%     0%          0          0
Vlanif1                     down  down      --     --          0          0
Vlanif2                     down  down      --     --          0          0
Vlanif3                     up    up        --     --          0          0
Vlanif10                    down  down      --     --          0          0
```

Table 5-6 Description of the **display interface brief** command output

Item	Description
Interface	Type and number of an interface. If **(v)** is displayed behind an interface number, the interface is a virtual interface.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
PHY	Physical status of an interface: • up: indicates that the interface is working properly. • down: indicates that the physical layer of the interface fails. • *down: Administratively Down, indicating that the administrator has run the **shutdown** command on the interface. • ^down: indicates that the interface is a backup interface. • (l): indicates that the loopback function is enabled on the interface. • (s): indicates that the spoofing function is enabled on the interface. • (b): indicates that the link layer of the interface is in BFD Down state. • (e): indicates that the link layer of the interface is in EFM Down state.
Protocol	Link layer protocol status of the interface: • up: indicates that the interface is working properly. • down: indicates that the link layer protocol of the interface fails. • (s): indicates that the spoofing function is enabled on the interface. • (b): indicates that the link layer of the interface is in BFD Down state. • (e): indicates that the link layer of the interface is in EFM Down state. • (d): indicates that the protocol module of the interface is suppressed. • --: indicates that the link layer protocol status is not obtained.
InUti	Average inbound bandwidth usage of an interface within the last 300 seconds. Average inbound bandwidth usage within the last 300 seconds = Average inbound traffic rate within the last 300 seconds/Interface bandwidth When the average bandwidth usage is smaller than 0.01% and greater than 0, the value 0.01% is displayed. When the interface bandwidth becomes lower, for example, the **speed** command is executed to reduce the bandwidth of an Ethernet interface, the bandwidth usage may be displayed as 100% because the traffic volume is not adjusted in time. "--" indicates that an interface does not support the display of bandwidth usage.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
OutUti	Average outbound bandwidth usage within the last 300 seconds. Average outbound bandwidth usage within the last 300 seconds = Average outbound traffic rate within the last 300 seconds/Interface bandwidth When the average bandwidth usage is smaller than 0.01% and greater than 0, the value 0.01% is displayed. When the interface bandwidth becomes lower, for example, the **speed** command is executed to reduce the bandwidth of an Ethernet interface, the bandwidth usage may be displayed as 100% because the traffic volume is not adjusted in time. "--" indicates that an interface does not support the display of bandwidth usage.
inErrors	Number of error packets received by an interface. The value becomes 0 when you run the **reset counters interface** command in the user view or when the number of received packets reaches the maximum value 0xFFFFFFFF.
outErrors	Number of error packets sent by an interface. The value becomes 0 when you run the **reset counters interface** command in the user view or when the number of sent packets reaches the maximum value 0xFFFFFFFF.

Related Topics

5.1.4 display interface

5.1.13 reset counters interface

5.1.6 display interface description

Function

The **display interface description** command displays the description of an interface.

Format

display interface description [*interface-type* [*interface-number*]]

display interface description [*interface-type*] [**main**]

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
interface-type [*interface-number*]	Displays the description of a specified interface. If an interface type is specified but no interface number is specified, the description of all interfaces of the specified type is displayed.	-
main	Displays the description of the main interface. • If an interface has no sub-interfaces, description about the interface are displayed whether you specify the **main** parameter or not. • If an interface has sub-interfaces, description about the interface and sub-interfaces are displayed if you do not specify the **main** parameter.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

The **display interface** command can also display the description of an interface. To quickly view the description of an interface, you are advised to use the **display interface description** command.

If no interface type is specified, the description of all interfaces is displayed. If an interface type is specified but no interface number is specified, the description of all interfaces of the specified type is displayed.

 Copyright © Huawei Technologies Co., Ltd.

Example

Display the description of Eth2/0/0.

```
<Huawei> display interface description ethernet 2/0/0
PHY: Physical
*down: administratively down
(l): loopback
(s): spoofing
(b): BFD down
^down: standby
(e): ETHOAM down
(v): VirtualPort
Interface                 PHY     Protocol Description
Eth2/0/0                   *down   down     HUAWEI, AR Series, Ethernet2/0/0 Interface
```

Table 5-7 Description of the **display interface description** command output

Item	Description
Interface	Type and number of an interface. If **(v)** is displayed behind an interface number, the interface is a virtual interface.
PHY	Physical status of an interface: • up: indicates that the interface is working properly. • down: indicates that the physical layer of the interface fails. • *down: Administratively Down, indicating that the administrator has run the **shutdown** command on the interface. • ^down: indicates that the interface is a backup interface. • (l): indicates that the loopback function is enabled on the interface. • (b): indicates that the physical layer of the interface is in BFD Down state.
Protocol	Link layer protocol status of the interface: • up: indicates that the interface is working properly. • down: indicates that the link layer protocol of the interface fails. • (l): indicates that the loopback function is enabled on the interface. • (s): indicates that the spoofing function is enabled on the interface. • (b): indicates that the link layer of the interface is in BFD Down state. • (e): indicates that the link layer of the interface is in EFM Down state. • --: indicates that the link layer protocol status of the interface is not obtained.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
Description	Interface description.

Related Topics

5.1.2 description (interface view)

5.1.7 display ip interface description

Function

The **display ip interface description** command displays IP-related information (such as the IP address, subnet mask, physical layer status, link layer protocol status, and number of interfaces in different states) and description of an interface.

Format

display ip interface description [*interface-type* [*interface-number*] | *interface-type* &<1-8>] | **slot** *slot-number*]

Parameters

Parameter	Description	Value
interface-type	Indicates the interface type. If no interface type is specified, IP-related configurations and statistics of all interfaces are displayed.	-
interface-number	Indicates the interface number, which is used together with *interface-type* to identify an interface. If no interface number is specified, IP-related configurations and statistics of interfaces in the same type are displayed.	-
interface-type	Indicates that the command can display IP-related information about interfaces of multiple types. The command can display IP-related information about interfaces in a maximum of eight types.	-
slot *slot-number*	Specifies the interface board number.	-

Views

All views

Default Level

1: Monitoring level

Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

Usage Scenario

Instead of running the **display ip interface brief** and **display interface description** commands, you can run the **display ip interface description** command to view both IP-related information and description of an interface, which facilitates the user operation.

Example

View IP-related information and description of a specified interface.

```
<Huawei> display ip interface description
Codes:
     Ana(Analogmodem),       Asy(Async),            Cell(Cellular),
     Dia(Dialer),            Eth(Ethernet)          GE(GigabitEthernet),
     H(Hssi),                Ima(Ima-group),        Loop(LoopBack),
     MTun(MTunnel),          S(Serial),             Tun(Tunnel),
     VE(Virtual-Ethernet),   VT(Virtual-Template)

     d(dampened),            D(down),               *D(administratively down),
     ^D(standby),            l(loopback),           s(spoofing),
     U(up),                  E(E-Trunk down)
------------------------------------------------------------------------------
Number of interfaces whose physical status is Up: 7
Number of interfaces whose physical status is Down: 4
Number of interfaces whose protocol status is Up: 4
Number of interfaces whose protocol status is Down: 7

Interface                   IP Address/Mask    Phy   Prot Description
Atm2/0/0                    unassigned         D     D
Eth1/0/0                    unassigned         U     D
Eth1/0/1                    10.1.1.2/24        U     U
GE0/0/0                     192.168.200.174/24 U     U
GE0/0/1                     unassigned         U     D
GE0/0/2                     unassigned         U     D
S6/0/0                      unassigned         U     U   NULL0
```

 Copyright © Huawei Technologies Co., Ltd.

Table 5-8 Description of the **display ip interface description** command output

Item	Description
Codes:	The following information provides the full spelling and explanation of the abbreviated interface names, physical status, and link layer protocols. ● Full spelling of the abbreviated interface names is as follows: – Ana: Analog modem interfaces – Asy: Async interfaces – Cell: Cellular interfaces – Dia: Dialer interfaces – Eth: Ethernet interfaces – GE: Gigabit Ethernet interfaces – H: Hssi interfaces – Ima: IMA-Group interfaces – Loop: Loopback interfaces – MTun: MTunnel interfaces – S: Serial interfaces – Tun: Tunnel interfaces – VE: Virtual-Ethernet interfaces – VT: Virtual-Template interfaces ● Explanation of the abbreviated physical status of the interface is as follows: – U: indicates that the physical status of the interface is Up.U(l) indicates that the interface is enabled with the loopback function. – D: indicates that the physical status of the interface is Down. – *D: indicates that the network administrator has run the **shutdown** command on the interface. – ^D: indicates that the FIB module is in the standby state. – s: indicates that the interface is in spoofing status. – E: indicates the physical status of the Eth-Trunk. ● Explanation of the abbreviated link layer protocol status is as follows: – U: indicates that the status of the link layer protocol on the interface is Up.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
	U(s) indicates that the link layer protocol of the interface is Up even though the interface is not configured with an IP address. (s) is an inherent attribute of the interface and will be displayed when the interface is configured with an IP address. (d) indicates that the protocol module of the interface is dampened. – D: indicates that the link layer protocol of the interface is Down or no IP address is assigned to the interface.
Number of interfaces whose physical status is Up:	Indicates the number of interfaces whose physical status is Up.
Number of interfaces whose physical status is Down:	Indicates the number of interfaces whose physical status is Down.
Number of interfaces whose protocol status is Up:	Indicates the number of interfaces whose link layer protocol is Up.
Number of interfaces whose protocol status is Down:	Indicates the number of interfaces whose link layer protocol is Down.
Interface	Indicates the name and number of an interface.
IP Address/Mask	Indicates the IP address and subnet mask of an interface.
Phy	Indicates the physical status of an interface.
Prot	Indicates the link layer protocol status of an interface.
Description	Indicates the description of an interface, expressed in characters. A maximum of 20 characters can be displayed. When the length of the description is greater than 20 characters, only the first 16 characters are displayed and the last 3 characters are replaced by ellipsis (...). If the description of an interface is the default setting, no information is displayed.

Related Topics

5.1.4 display interface

 Copyright © Huawei Technologies Co., Ltd.

5.1.8 display interface counters

Function

The **display interface counters** command displays packet statistics on physical interfaces.

Format

display interface [*interface-type*] **counters** { **inbound** | **outbound** }

Parameters

Parameter	Description	Value
interface-type	Displays statistics about packets sent and received by an interface.	-
inbound	Displays statistics about packets received by an interface.	-
outbound	Displays statistics about packets sent by an interface.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

Usage Scenario

The **display interface counters** command can be used when you need to:

- Check whether an interface is sending and receiving packets normally during interface fault diagnosis.
- Collect traffic statistics on an interface.
- Check whether an interface can send and receive multicast packets after the multicast function is configured.

If no interface type is specified, the statistics of packets sent and received by all interfaces are displayed. If an interface type is specified but no interface number is specified, the statistics about packets sent and received by all interfaces of this type are displayed.

Follow-up Procedure

 Copyright © Huawei Technologies Co., Ltd.

If you want to collect new traffic statistics, run the **reset counters interface** command to clear the current statistics.

Example

Display statistics about packets received by an interface.

```
<Huawei> display interface gigabitethernet counters inbound
Interface         Total       UniCast     MultiCast     BroadCast      Err
                  (pkts)      (pkts)       (pkts)       (pkts)    (pkts)
GE0/0/0           45403        8196         11094         26113        0
GE0/0/1               0           0             0             0
GE0/0/2            2778           0             0          2778        0
GE7/0/0               0           0             0             0
GE7/0/1               0           0             0             0
GE7/0/2               0           0             0             0
GE7/0/3               0           0             0             0
GE7/0/4               0           0             0             0
GE7/0/5           47182           1         47176             5        0
GE7/0/6               0           0             0             0
GE7/0/7               0           0             0             0
GE7/0/8               0           0             0             0
GE7/0/9               0           0             0             0
GE7/0/10              0           0             0             0
GE7/0/11              0           0             0             0
GE7/0/12              0           0             0             0
GE7/0/13              0           0             0             0
GE7/0/14              0           0             0             0
GE7/0/15              0           0             0             0
GE7/0/16              0           0             0             0
GE7/0/17              0           0             0             0
GE7/0/18              0           0             0             0
GE7/0/19              0           0             0             0
GE7/0/20              0           0             0             0
GE7/0/21              0           0             0             0
GE7/0/22              0           0             0             0
GE7/0/23              0           0             0             0

NOTICE
  OverFlow :more than 14 decimal digits (8 digits for column "Err").
       -- :not supported.
```

Table 5-9 Description of the **display interface counters** command output

Item	Description
Interface	Type and number of an interface.
Total	Total number of packets sent and received by an interface.
UniCast	Number of unicast packets sent or received by an interface.
MultiCast	Number of multicast packets sent or received by an interface.
BroadCast	Number of broadcast packets sent or received by an interface.
Err	Number of error packets sent or received by an interface.

Copyright © Huawei Technologies Co., Ltd.

Related Topics

5.1.4 display interface
5.1.5 display interface brief

5.1.9 display ip interface

Function

The **display ip interface** command displays the IP configuration and statistics on interfaces. The statistics include the number of packets and bytes received and sent by interfaces, number of multicast packets sent and received by interfaces, and number of broadcast packets received, sent, forwarded, and discarded by interfaces.

The **display ip interface brief** command displays brief information about interface IP addresses, including the IP address, subnet mask, physical status, link-layer protocol status, and number of interfaces in different states.

Format

display ip interface [*interface-type interface-number*]

display ip interface brief [*interface-type* [*interface-number*] | **slot** *slot-id* [**card** *card-number*]]

display ip interface brief [*interface-type*] &<1-8>

Parameters

Parameter	Description	Value
interface-type interface-number	Specifies the type and number of an interface. If no interface is specified, IP configuration and statistics about all interfaces are displayed.	-
brief	Displays brief information, including the IP address, subnet mask, physical status, link-layer protocol status, and number of interfaces in different states.	-
slot *slot-id*	Displays the IP configuration and statistics of interfaces on the specified slot. If the slot number is not specified, brief information related to the IP addresses of the interfaces on all interface boards and main control boards is displayed.	-
card *card-number*	Displays the IP configuration and statistics of interfaces on specified card.	-

Views

All views

Copyright © Huawei Technologies Co., Ltd.

Default Level

1: Monitoring level

Usage Guidelines

You can run the **display ip interface brief** command to view the following information:

- IP configurations of all interfaces
- IP configurations of interfaces of the specified type and a specified interface
- IP configurations of interfaces that have IP addresses

This command, however, cannot display the IP configurations of Layer 2 interfaces or Eth-Trunk member interfaces.

NOTE

- You can run the **display interface description** command to view the interface description.
- You can run the **display interface** command to view detailed information about the running status and statistics on the interface.

Example

Display the IP configuration and statistics on GE0/0/0.

```
<Huawei> display ip interface gigabitethernet 0/0/0
GigabitEthernet0/0/0 current state : UP
Line protocol current state : UP
The Maximum Transmit Unit : 1500 bytes
input packets : 1431, bytes : 97912, multicasts : 1426
output packets : 2716, bytes : 179760, multicasts : 2710
Directed-broadcast packets:
 received packets:          0, sent packets:          0
 forwarded packets:         0, dropped packets:       0
ARP packet input number:        11
  Request packet:               11
  Reply packet:                 0
  Unknown packet:               0
Internet Address is 10.5.40.1/24
Broadcast address : 10.5.40.255
TTL being 1 packet number:      0
TTL invalid packet number:      0
ICMP packet input number:       0
  Echo reply:                   0
  Unreachable:                  0
  Source quench:                0
  Routing redirect:             0
  Echo request:                 0
  Router advert:                0
  Router solicit:               0
  Time exceed:                  0
  IP header bad:                0
  Timestamp request:            0
  Timestamp reply:              0
  Information request:          0
  Information reply:            0
  Netmask request:              0
  Netmask reply:                0
  Unknown type:                 0
```

 Copyright © Huawei Technologies Co., Ltd.

Table 5-10 Description of the **display ip interface** command output

Item	Description
GigabitEthernet1/0/0 current state	Physical status of GigabitEthernet1/0/0: • UP: indicates that the interface is physically Up. • DOWN: indicates that the interface is physically Down. • Administratively DOWN: indicates that the administrator has run the **shutdown** command on the interface.
Line protocol current state	Link layer protocol status of the interface: • UP: The link layer protocol of the interface is running properly. • DOWN: The link layer protocol of the interface is Down or no IP address is configured on the interface.
The Maximum Transmit Unit	MTU of the interface. The default MTU of an Ethernet interface is 1500 bytes. Packets longer than the MTU are fragmented before being transmitted. If fragmentation is not allowed, the packets are discarded.
input packets : 1431, bytes : 97912, multicasts : 1426	Total number of packets, bytes, and multicast packets received by the interface.
output packets : 2716, bytes : 179760, multicasts : 2710	Total number of packets, bytes, and multicast packets sent by the interface.
Directed-broadcast packets	Number of packets broadcast on the interface directly.
received packets	Total number of received packets.
sent packets	Total number of sent packets.
forwarded packets	Total number of forwarded packets.
dropped packets	Total number of discarded packets.
ARP packet input number	Number of received ARP packets.
Request packet	Number of request packets.
Reply packet	Number of response packets.
Unknown packet	Number of unknown packets.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
Internet Address is	IP address and subnet mask of the interface. The displayed information varies according to the IP address allocation mode: • If the IP address is manually configured, the information is displayed as "Internet Address is 10.5.40.1/24." • If the IP address is obtained using DHCP, the information is displayed as "Internet Address is allocated by DHCP, 10.5.40.1/24."
Broadcast address	Broadcast address of an interface.
TTL being 1 packet number	Number of packets with TTL 1.
TTL invalid packet number	Number of packets with invalid TTL.
ICMP packet input number	Number of received ICMP packets.
Echo reply	Number of Echo Reply packets.
Unreachable	Number of Destination Unreachable packets.
Source quench	Number of Source Quench packets.
Routing redirect	Number of Redirect packets.
Echo request	Number of Echo Request packets.
Router advert	Number of Router Advertisement packets.
Router solicit	Number of Router Solicitation packets.
Time exceed	Number of Time Exceeded packets.
IP header bad	Number of IP header error packets.
Timestamp request	Number of Timestamp Request packets.
Timestamp reply	Number of Timestamp Reply packets.
Information request	Number of Information Request packets.
Information reply	Number of Information Reply packets.
Netmask request	Number of Address Mask Request packets.
Netmask reply	Number of Address Mask Reply packets.
Unknown type	Number of unknown packets.

Display brief IP information about all interfaces.

```
<Huawei> display ip interface brief
*down: administratively down
^down: standby
(l): loopback
```

 Copyright © Huawei Technologies Co., Ltd.

```
(s): spoofing
(E): E-Trunk down
The number of interface that is UP in Physical is 2
The number of interface that is DOWN in Physical is 3
The number of interface that is UP in Protocol is 2
The number of interface that is DOWN in Protocol is 3

Interface                   IP Address/Mask      Physical   Protocol
Atm0/0/0                    unassigned           down       down
Bridge-if10                 unassigned           down       down
MFR0/0/1                    unassigned           down       down
NULL0                       unassigned           up         up(s)
Vlanif1                     192.168.200.161/24   up         up
```

Table 5-11 Description of the **display ip interface brief** command output

Item	Description
*down:	Reason why an interface is physically Down. Administratively down indicates that the administrator has run the **shutdown** command on the interface.
^down: standby	Indicates that the interface is a backup interface.
(l): loopback	Indicates that the loopback function is enabled on the interface.
(s): spoofing	Indicates that the spoofing function is enabled on the interface.
(E): E-Trunk down	Indicates that the Eth-Trunk is Down because of the protocol negotiation on the E-Trunk.
The number of interface that is UP/DOWN in Physical is	Up or Down state of a physical link and number of interfaces in different states.
The number of interface that is UP/DOWN in Protocol is	Up or Down state of the protocol and number of interfaces in different states.
Interface	Interface type and number.
IP Address/ Mask	IP address and subnet mask of an interface.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
Physical	Physical status of an interface: • Up: indicates that the interface is physically Up. (l) indicates that the loopback function is configured on the interface. • Down: indicates that the interface becomes faulty. • *down: indicates that the administrator has run the **shutdown (interface view)** command on the interface. (l) indicates that the loopback function is configured on the interface. • !down: indicates that the FIB module is suspended. In this case, the link protocol status of the interface is Down.
Protocol	Link protocol status of the interface: • Up: indicates that the link protocol of the interface is running properly. (s) indicates that the link protocol status of the interface is Up when this interface is created and has no IP address configured. This is an inherent attribute of an interface. When this interface is configured with an IP address, (s) is still displayed. • Down: indicates that the link protocol of the interface fails or no IP address is configured on the interface. (l) indicates that the loopback function is configured on the interface.

Related Topics

5.1.4 display interface

5.1.10 display this interface

Function

The **display this interface** command displays interface information in the current interface view.

Format

display this interface

Parameters

None

Views

Interface view

Copyright © Huawei Technologies Co., Ltd.

Default Level

1: Monitoring level

Usage Guidelines

In the interface view, you can run the **display this interface** command to rapidly view the status of the interface and packet statistics on the interface.

Example

Display information about Eth2/0/0.

```
<Huawei> system-view
[Huawei] interface ethernet 2/0/0
[Huawei-Ethernet2/0/0] display this interface
Ethernet2/0/0 current state : UP
Line protocol current state : UP
Description:HUAWEI, AR Series, Ethernet2/0/0 Interface
Switch Port, PVID :    1, TPID : 8100(Hex), The Maximum Frame Length is 9216
IP Sending Frames' Format is PKTFMT_ETHNT_2, Hardware address is 0819-a6cd-a894
Last physical up time   : 2012-09-10 10:26:36
Last physical down time : 2012-09-10 10:21:00
Current system time: 2012-09-12 16:56:03
Port Mode: COMMON COPPER
Speed : 1000,  Loopback: NONE
Duplex: FULL,  Negotiation: ENABLE
Mdi   : AUTO,  Clock   : -
Last 300 seconds input rate 152 bits/sec, 0 packets/sec
Last 300 seconds output rate 648 bits/sec, 0 packets/sec
Input peak rate 1872 bits/sec,Record time: 2012-09-12 10:21:53
Output peak rate 2248 bits/sec,Record time: 2012-09-10 10:26:42

Input:  793 packets, 463059 bytes
  Unicast:               0,  Multicast:             793
  Broadcast:             0,  Jumbo:                   0
  Discard:               0,  Total Error:             0

  CRC:                   0,  Giants:                  0
  Jabbers:               0,  Throttles:               0
  Runts:                 0,  Symbols:                 0
  Ignoreds:              0,  Frames:                  0

Output:  104596 packets, 15863891 bytes
  Unicast:               0,  Multicast:          104596
  Broadcast:             0,  Jumbo:                   0
  Discard:               0,  Total Error:             0

  Collisions:            0,  ExcessiveCollisions:     0
  Late Collisions:       0,  Deferreds:               0

    Input bandwidth utilization threshold : 100.00%
    Output bandwidth utilization threshold: 100.00%
    Input bandwidth utilization  :    0%
    Output bandwidth utilization : 0.01%
```

 Copyright © Huawei Technologies Co., Ltd.

Table 5-12 Description of the **display this interface** command output

Item	Description
current state	Current interface status: • DOWN: indicates that the interface is disabled. • UP: indicates that the interface is enabled. • Administratively Down: indicates that the administrator has run the **shutdown** command on the interface.
Line protocol current state	Link layer protocol status of the interface: • DOWN: indicates that the link layer protocol of the interface fails or no IP address is assigned to the interface. • UP: indicates that the link layer protocol of the interface is running properly.
Description	Interface description.
PVID	Default VLAN ID of the interface.
TPID	Type of frames that are supported on the interface. By default, this field displays 0x8100, indicating an 802.1Q frame. If the device does not support 802.1Q frames, the interface discards the 802.1Q frames immediately after receiving them. This field is displayed only for a Layer 2 interface.
The Maximum Frame Length	Maximum frame length allowed by the interface.
IP Sending Frames' Format	Format of the frame contained in the sent IP packet, which can be PKTFMT_ETHNT_2, Ethernet_802.3, or Ethernet_SNAP.
Hardware address	MAC address of the device.
Last physical up time	Last time the interface went Up physically. If this field displays "-", the physical status of the interface does not change.
Last physical down time	Last time the interface went Down physically. If this field displays "-", the physical status of the interface does not change.
Current system time	Current system time. If the time zone is configured and the daylight saving time is used, the time is in YYYY-MM-DD HH:MM:SS UTC±HH:MM DST format.
Speed	Current rate of an interface.
Loopback	Loopback configuration of the interface.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Duplex	Duplex mode of the interface.
Negotiation	Auto-negotiation mode of the interface.
Mdi	Network cable type of the interface.
Clock	Clock mode of the combo interface.
Last 300 seconds input rate	Incoming packet rate (bits per second and packets per second) within the last 300 seconds.
Last 300 seconds output rate	Outgoing packet rate (bits per second and packets per second) within the last 300 seconds.
Input peak rate	Maximum incoming packet rate.
Output peak rate	Maximum outgoing packet rate.
Input	Total number of received packets.
Output	Total number of sent packets.
Unicast	Number of unicast packets received or sent by the interface.
Multicast	Number of multicast packets received or sent by the interface.
Broadcast	Number of broadcast packets received or sent by the interface.
Jumbo	Number of jumbo frames received or sent by the interface.
Discard	Number of packets discarded by the interface during physical layer detection.
Total Error	Number of error packets found during physical layer detection.
CRC	Number of CRC error packets received by the interface.
Giants	Number of jumbo frames with the correct FCS received by the interface. **NOTE** For the AR109, AR109W, AR109GW-L, AR121, AR121W, AR121GW-L, AR129, AR129W, AR129CVW, AR129CV, AR129GW-L, AR129CGVW-L, AR161, AR161W, AR161EW, AR161EW-M1, AR161G-L, AR161G-Lc, AR161G-U, AR169, AR169W, AR169EW, AR169CVW, AR169EGW-L, AR169CVW-4B4S, AR169G-L, AR169-P-M9, AR169W-P-M9, AR169RW-P-M9, this item indicates the number of received packets with length exceeding the maximum jumbo frame size.
Jabbers	Number of jumbo frames with incorrect FCS received by the interface.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
Throttles	Number of undersized frames with incorrect FCS received by the interface.
Runts	Number of undersized frames with the correct FCS received by the interface.
Symbols	Number of received frames with coding errors.
Ignoreds	Number of received MAC control frames with OpCode not being PAUSE.
Frames	Number of packets with incorrect 802.3 length.
Collisions	Number of sent packets with 1 to 15 conflict events.
ExcessiveCollisions	Number of packets with 16 conflict events and failing to be sent.
Late Collisions	Number of packets with conflict and delayed.
Deferreds	Number of delayed packets without conflict.
Input bandwidth utilization threshold	Threshold for inbound bandwidth usage.
Output bandwidth utilization threshold	Threshold for outbound bandwidth usage.
Input bandwidth utilization	Inbound bandwidth usage. This parameter is not collected on interfaces that do not support statistics collection, and the value is fixed at 0% or --.
Output bandwidth utilization	Outbound bandwidth usage. This parameter is not collected on interfaces that do not support statistics collection, and the value is fixed at 0% or --.

Related Topics

5.1.4 display interface
5.1.5 display interface brief

5.1.11 interface

Function

The **interface** command displays the interface view or sub-interface view.

Format

interface *interface-type interface-number*

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
interface-type interface-number	Specifies the type and number of an interface. The interface type and number can be closely next to each other or separated by a space character. • To create a sub-interface or enter a sub-interface view, specify *interface-number* in the format of main interface number.sub-interface number. For example, the number of sub-interface 1 on GE1/0/0 is GE1/0/0.1. • To create a channelized interface or enter the view of a channelized interface, specify *interface-number* in the format of main interface number: channelized interface number. For example, the number of channelized interface 1 on E1 2/0/0 is Serial2/0/0:1.	-

Views

System view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

After the specified interface view is displayed, you can set attributes for the interface.

Precautions

- The **interface** command can display only the view of an existing physical interface and cannot create a physical interface.
- The **interface** command can create a logical interface and display the view of the logical interface.

Example

Display the view of Eth2/0/0.

```
<Huawei> system-view
[Huawei] interface ethernet 2/0/0
[Huawei-Ethernet2/0/0]
```

Display the view of MEth interface.

```
<Huawei> system-view
[Huawei] interface MEth 0/0/0
[Huawei-MEth0/0/0]
```

Related Topics

5.1.4 display interface

Copyright © Huawei Technologies Co., Ltd.

5.1.12 reset counters if-mib interface

Function

The **reset counters if-mib interface** command clears interface traffic statistics in the Network Management System (NMS).

Format

reset counters if-mib interface [*interface-type* [*interface-number*]]

Parameters

Parameter	Description	Value
interface-type [*interface-number*]	Clears traffic statistics on a specified interface in the NMS. • *interface-type* specifies the interface type. • *interface-number* specifies the interface number. If an interface type is specified but no interface number is specified, traffic statistics on all interfaces of the specified type are cleared.	-

Views

User view

Default Level

3: Management level

Usage Guidelines

Usage Scenario

Before collecting traffic statistics on a specific interface within a period in the NMS, clear existing traffic statistics on this interface in the NMS.

NOTE

For details on how to view interface traffic statistics in the NMS, see the NMS documentation.

Precautions

- If no interface type and number are specified, traffic statistics of all interfaces in the NMS are cleared.
- After you run the **reset counters if-mib interface** command, traffic statistics on all interfaces in the NMS are cleared. Therefore, confirm the action before you run this command.

Copyright © Huawei Technologies Co., Ltd.

- Running the **reset counters if-mib interface** command does not affect the interface traffic statistics displayed by the **display interface** command. To clear the interface traffic statistics displayed by the **display interface** command, run the **reset counters interface** command.

Example

Clear traffic statistics on Eth2/0/0 in the NMS.

```
<Huawei> reset counters if-mib interface ethernet 2/0/0
```

Related Topics

5.1.13 reset counters interface

5.1.13 reset counters interface

Function

The **reset counters interface** command clears traffic statistics about a specified interface.

Format

reset counters interface [*interface-type* [*interface-number*]]

Parameters

Parameter	Description	Value
interface-type [*interface-number*]	Clears traffic statistics on a specified interface. • *interface-type* specifies the interface type. • *interface-number* specifies the interface number. If an interface type is specified but no interface number is specified, traffic statistics on all interfaces of the specified type are cleared.	-

Views

User view

Copyright © Huawei Technologies Co., Ltd.

Default Level

3: Management level

Usage Guidelines

Usage Scenario

Before collecting traffic statistics on an interface within a certain period, run the **reset counters interface** command to clear existing traffic statistics.

Precautions

- Statistics cannot be restored after being cleared. Therefore, exercise caution before clearing the statistics.
- Traffic accounting is based on the packet statistics on an interface. The clearing of the packet statistics on an interface by using the **reset counters interface** command affects the traffic accounting result. Therefore, do not randomly clear the packet statistics on an interface in a normal application environment.
- If no interface type is specified, traffic statistics on all types of interfaces are cleared. If an interface type is specified but no interface number is specified, traffic statistics on all interfaces of the specified type are cleared.
- Running the **reset counters interface** command clears the statistics about received and transmitted packets on the interface in a certain period. The certain period is configured by using the **set flow-stat interval** *interval-time* command.

Example

Clear traffic statistics on all interfaces.

```
<Huawei> reset counters interface
```

Clear traffic statistics on VLANIF10.

```
<Huawei> reset counters interface vlanif 10
```

Related Topics

5.1.4 display interface
5.1.5 display interface brief

5.1.14 restart (interface view)

Function

The **restart** command restarts an interface.

Format

restart

 Copyright © Huawei Technologies Co., Ltd.

Parameters

None

Views

Interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

After modifying parameters of an interface, run the **restart** command to make the modification take effect.

Precautions

- Restarting an interface during data transmission will cause data frame loss or service interruption. Exercise caution when you use the **restart** command.
- Running the **restart** command is equivalent to running the **shutdown** command and the **undo shutdown** command in sequence.

Example

Restart Eth2/0/0.

```
<Huawei> system-view
[Huawei] interface ethernet 2/0/0
[Huawei-Ethernet2/0/0] restart
```

Related Topics

5.1.16 shutdown (interface view)

5.1.15 set flow-stat interval

Function

The **set flow-stat interval** command sets the interval for collecting the traffic statistics on interfaces.

The **undo set flow-stat interval** command restores the default interval for collecting traffic statistics on interfaces.

By default, the interval for collecting traffic statistics on interfaces is 300 seconds.

Format

set flow-stat interval *interval-time*

undo set flow-stat interval

 Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
interval-time	Specifies the interval for collecting traffic statistics on interfaces.	The value is an integer that ranges from 10 to 600, in seconds. In addition, the value must be a multiple of 10. The default value is 300s.

Views

System view, interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

By using the **set flow-stat interval** command to set the interval for collecting traffic statistics on interfaces, you can collect and analyze traffic statistics according to your needs. You can also take traffic control measures based on the traffic statistics to prevent network congestion and service interruption.

- When congestion occurs, set the interval for collecting traffic statistics on an interface to less than 300 seconds, or 30 seconds if congestion worsens. Then observe the traffic distribution on the interface within a short period of time. If data packets cause congestion, take proper measures to control the rate of the packets.
- When the network bandwidth is sufficient and services are running properly, set the interval for collecting traffic statistics on an interface to more than 300 seconds. If the value of any traffic parameter is not within the specified range, change the interval for collecting traffic statistics to observe the traffic volume in real time.

Precautions

- The interval configured in the system view takes effect on all the interfaces that use the default interval.
- The interval configured in the interface view takes effect only on the current interface.
- The interval configured in the interface view takes precedence over the interval configured in the system view.
- The new interval takes effect after the original interval expires. Traffic statistics on logical interfaces are displayed in the second periodical update after the new interval takes effect. Traffic statistics on physical interfaces are displayed when the new interval takes effect.

 Copyright © Huawei Technologies Co., Ltd.

Example

Set the interval for collecting traffic statistics on Eth2/0/0 to 400s.

```
<Huawei> system-view
[Huawei] interface ethernet 2/0/0
[Huawei-Ethernet2/0/0] set flow-stat interval 400
```

Related Topics

5.1.4 display interface

5.1.13 reset counters interface

5.1.13 reset counters interface

5.1.16 shutdown (interface view)

Function

The **shutdown** command disables an interface.

The **undo shutdown** command enables an interface.

By default, interfaces are enabled.

Format

shutdown

undo shutdown

Parameters

None

Views

Interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

After modifying parameters of an interface, run the **shutdown** and **undo shutdown** commands to make the modification take effect.

When an interface is not connected to a cable or fiber, you can use the **shutdown** command to disable the interface to prevent exceptions caused by interference.

Precautions

- Disabling an interface during data transmission will cause data frame loss or service interruption. Exercise caution when you use the **shutdown** command.

 Copyright © Huawei Technologies Co., Ltd.

- Some logical interfaces, such as Virtual-Template and null interfaces, do not support the **shutdown** and **undo shutdown** commands.
- If you run the **shutdown** command in the Eth-Trunk interface view, all Eth-Trunk member interfaces are disabled.
- Running the **shutdown** and **undo shutdown** commands is equivalent to running the **restart** command.
- When an interface is configured with a sub-interface, the default interval for running the **shutdown** and **undo shutdown** commands on the main interface is 15 seconds. To change the interval, run the **shutdown interval** command.

Example

Shut down Eth2/0/0.

```
<Huawei> system-view
[Huawei] interface ethernet 2/0/0
[Huawei-Ethernet2/0/0] shutdown
```

Related Topics

5.1.4 display interface

5.1.14 restart (interface view)

5.1.17 shutdown interval

Function

The **shutdown interval** command sets the minimum interval for re-enabling an interface.

The **undo shutdown interval** command restores the default minimum interval for re-enabling an interface.

By default, the minimum interval for re-enabling an interface is 0 seconds.

Format

shutdown interval *interval-value*

undo shutdown interval

Parameters

Parameter	Description	Value
interval-value	Specifies the minimum interval for re-enabling an interface.	The value is an integer that ranges from 5 to 15, in seconds.

Views

System view

Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

In some cases, for example, when parameters of an interface are modified but the modification does not take effect immediately, run the **shutdown** and **undo shutdown** commands to re-enable the interface. Then the modification can take effect. To shorten the waiting time, run the **shutdown interval** command to set the minimum interval for re-enabling an interface.

Precautions

- The minimum interval configured using this command also applies to the **restart** command.

Example

Set the minimum interval for re-enabling an interface to 5 seconds.

```
<Huawei> system-view
[Huawei] shutdown interval 5
```

Related Topics

5.1.16 shutdown (interface view)

5.1.14 restart (interface view)

5.2 Ethernet Interface Configuration Commands

NOTE

The AR100&AR120&AR150&AR160&AR200 series, AR1200 series, AR2220E, AR2201-48FE, AR2202-48FE, AR2204-51GE-P, AR2204-51GE-R, AR2204-27GE-P, AR2204-27GE, AR2204E, AR2204E-D, and AR2204 only support isolation at Layer 2 and interworking at Layer 3. GE0/0/3 to GE0/0/26 on the AR2204-51GE-P and AR2204-51GE-R cannot be isolated from GE0/0/27 to GE0/0/50.

An interface on the 4GE-2S, 9ES2, 4ES2G-S or 4ES2GP-S card cannot be isolated from an interface on other cards.

The interface on 8FE1GE card support configuring the IFG and interface isolated.

The AR2200&AR3200 series support configuring the IFG and interface isolated.

5.2.1 am isolate

Function

The **am isolate** command isolates the current interface from a specified interface unidirectionally.

The **undo am isolate** command cancels unidirectional isolation between the current interface and a specified interface. If no interface is specified,

 Copyright © Huawei Technologies Co., Ltd.

unidirectional isolation between the current interface and all the other interfaces is canceled.

By default, no unidirectional isolation is configured between the current interface and a specified interface

Format

am isolate { *interface-type interface-number* }&<1-8>

undo am isolate [*interface-type interface-number*]&<1-8>

Parameters

Parameter	Description	Value
interface-type interface-number	Specifies the type and number of the interface from which the current interface is isolated unidirectionally. • *interface-type* specifies the type of the interface. • *interface-number* specifies the number of the interface.	-

Views

Ethernet interface view, GE interface view, Eth-Trunk interface view, port group view, XGE interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The **am isolate** command isolates interfaces unidirectionally. For example, if interface A is isolated from interface B unidirectionally, packets sent from interface A cannot reach interface B, but packets sent from interface B can reach interface A. Unidirectional isolation needs to be configured in the following scenarios:

- When multiple hosts connect to different interfaces of a device and a host sends many broadcast packets to the other hosts, isolate the interface connected to the host from other interfaces unidirectionally. Then the other hosts do not receive packets from the host.
- Interfaces in a port isolation group are isolated from each other, but interfaces in different port isolation groups can communicate. To isolate

 Copyright © Huawei Technologies Co., Ltd.

interfaces in different port isolation groups, configure unidirectional isolation between these interfaces.

By default, only Layer 2 packets of the current interface are isolated from a specified interface, but Layer 3 packets are not isolated. To isolate both Layer 2 and Layer 3 packets on interfaces unidirectionally, run the **port-isolate mode all** command.

Precautions

An interface can be unidirectionally isolated from another type of interface. However, an interface cannot be unidirectionally isolated from itself or from the management interface. In addition, an Eth-Trunk cannot be unidirectionally isolated from its member interfaces.

An interface on the 4GE-2S, 9ES2, 4ES2G-S or 4ES2GP-S card cannot be unidirectionally isolated from an interface on other cards.

NOTE

An interface on the AR100&AR120&AR150&AR160 can be isolated from a maximum of 4 interfaces unidirectionally.

An interface on the AR200, AR1200, AR2200, AR3200 and AR3600 can be isolated from a maximum of 32 interfaces unidirectionally.

Example

Isolate Eth2/0/0 from Eth1/0/0 unidirectionally.

```
<Huawei> system-view
[Huawei] interface ethernet 2/0/0
[Huawei-Ethernet2/0/0] am isolate ethernet 1/0/0
```

Related Topics

5.2.33 port-isolate mode

5.2.2 auto duplex

Function

The **auto duplex** command configures the duplex mode on an Ethernet electrical interface in auto-negotiation mode.

The **undo auto duplex** command restores the default duplex mode on an Ethernet electrical interface in auto-negotiation mode.

By default, the duplex mode on an Ethernet electrical interface is negotiated with the peer interface.

Format

auto duplex { **half** | **full** }*

undo auto duplex

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
half	Sets the duplex mode on an Ethernet electrical interface in auto-negotiation mode to half-duplex.	-
full	Sets the duplex mode on an Ethernet electrical interface in auto-negotiation mode to full-duplex.	-

Views

MEth interface view, Ethernet interface view, GE interface view, port group view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

In auto-negotiation mode, interfaces on both ends of a link negotiate their duplex mode. If the negotiated duplex mode is not the required one, you can run the **auto duplex** command to set the required duplex mode in auto-negotiation mode. For example, two interfaces on both ends support full-duplex mode and half-duplex mode. If the two interfaces negotiate to work in half-duplex mode, but they are required to work in full-duplex mode, you can run the **auto duplex full** command to set the full-duplex mode for the two interfaces.

Prerequisites

The Ethernet interface works in auto-negotiation mode.

Precautions

- By default, an Ethernet interface works in auto-negotiation mode, which is recommended. If the negotiation succeeds, the two interfaces work at the same duplex mode and speed. The settings of the SPEED and DUPLEX parameters and auto-negotiation mode must be the same at the local and peer ends. Otherwise, negotiation may fail. The interface auto-negotiation mode, duplex mode and speed support depend on the device.
- In auto-negotiation mode, an FE electrical interface negotiates the duplex mode with the peer device on the link.
- In auto-negotiation mode, a GE electrical interface that works at a rate of 1000 Mbit/s supports the full-duplex mode. If the duplex mode is changed to

 Copyright © Huawei Technologies Co., Ltd.

half-duplex, the GE electrical interface works at a maximum rate of 100 Mbit/s.

Example

Configure Ethernet electrical interface Eth2/0/0 in auto-negotiation mode to work in half-duplex mode.

```
<Huawei> system-view
[Huawei] interface ethernet 2/0/0
[Huawei-Ethernet2/0/0] auto duplex half
```

Related Topics

5.2.28 negotiation auto

5.2.3 auto speed

Function

The **auto speed** command configures the auto-negotiation rate of an Ethernet electrical interface.

The **undo auto speed** command restores the default auto-negotiation rate of an Ethernet electrical interface.

By default, Ethernet electrical interfaces on both ends can negotiate to any rate they support.

Format

auto speed { **10** | **100** | **1000** } *

undo auto speed

NOTE

GE optical interfaces do not support this command.

Parameters

Parameter	Description	Value
10	Sets the auto-negotiation rate of an Ethernet electrical interface to 10 Mbit/s.	-
100	Sets the auto-negotiation rate of an Ethernet electrical interface to 100 Mbit/s.	-

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
1000	Sets the auto-negotiation rate of an Ethernet electrical interface to 1000 Mbit/s. **NOTE** FE electrical interfaces do not support this parameter.	-

Views

MEth interface view, Ethernet interface view, GE interface view, port group view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

In auto-negotiation mode, interfaces on both ends of a link negotiate their rate. If the negotiated rate is not the required one, run the **auto speed** command to set the auto-negotiation rate range to limit the negotiated rate. For example, if two interfaces negotiate to work at a rate of 1000 Mbit/s, but they are required to work at a rate of 100 Mbit/s, you can run the **auto speed 100** command to set the rate of the interfaces to 100 Mbit/s.

By default, an Ethernet interface works in auto-negotiation mode, which is recommended. If the negotiation succeeds, the two interfaces work at the same duplex mode and speed. The settings of the SPEED and DUPLEX parameters and auto-negotiation mode must be the same at the local and peer ends. Otherwise, negotiation may fail. The interface auto-negotiation mode, duplex mode and speed support depend on the device.

Prerequisites

The Ethernet interface works in auto-negotiation mode. For details, see **negotiation auto**.

Example

Configure Ethernet electrical interface Eth2/0/0 to work at a rate of 100 Mbit/s in auto-negotiation mode.

```
<Huawei> system-view
[Huawei] interface ethernet 2/0/0
[Huawei-Ethernet2/0/0] auto speed 100
```

Related Topics

5.2.28 negotiation auto

Copyright © Huawei Technologies Co., Ltd.

5.2.4 clock (Ethernet interface view)

Function

The **clock** command configures the clock mode of a combo interface.

The **undo clock** command restores the default setting.

By default, a combo interface automatically selects the clock mode, and preferentially works in slave clock mode to use line clock signals.

Format

clock [**auto perfer**] { **master** | **slave** }

undo clock

Parameters

Parameter	Description	Value
auto perfer	Allows a combo interface to automatically select the clock mode. If this parameter is not configured, you must manually specify the clock mode of a combo interface.	-
master	Configures a combo interface to work in master clock mode.	-
slave	Configures a combo interface to work in slave clock mode.	-

Views

GE interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

A combo interface on a router is connected to an Ethernet interface that supports the clock function on the peer end. To exchange data successfully, interfaces on the two communicating parties must work in clock synchronization state.

A combo interface works in either of the following clock modes:

- Master: uses clock signals provided by the interface card.
- Slave: uses line clock signals.

Copyright © Huawei Technologies Co., Ltd.

When a router is connected to an Ethernet interface on the peer end and both the connected interfaces support the clock function, you must configure the interfaces to work in master and slave clock modes respectively.

- When you manually specify the clock modes of the two interfaces, you must configure one interface to work in master clock mode and the other in slave clock mode.
- When you manually specify the clock mode of an interface and configure the other interface to automatically select the clock mode, the other interface will automatically select the clock mode opposite to the specified the clock mode of the peer interface.
- When you configure both the interfaces to automatically select the clock mode, the interfaces will select different clock modes.

Precautions

- When the peer Ethernet interface does not support the clock function, you do not need to configure the clock mode for the combo interface.

Example

Configure GE2/0/0 to work in master clock mode.

```
<Huawei> system-view
[Huawei] interface gigabitethernet 2/0/0
[Huawei-GigabitEthernet2/0/0] clock master
```

Related Topics

5.2.5 combo-port

5.2.5 combo-port

Function

The **combo-port** command configures the working mode of a combo interface.

The **undo combo-port** command restores the default setting.

A combo interface works in auto mode and automatically works as an optical or electrical interface by default.

Format

combo-port { **auto** | **copper** | **fiber** }

undo combo-port

 Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
auto	Allows a combo interface to automatically select the working mode. The device checks the interface status and selects the working mode as follows: ● If the electrical interface becomes Up first, the combo interface works in electrical mode. ● If the optical interface becomes Up first, the combo interface works in optical mode. ● If the interface is in Down state, and an optical module is not installed, the combo interface works in electrical mode. ● If the interface is in Down state, and an optical module is installed, the combo interface works in optical mode.	-

 Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
	NOTE If the electrical interface is connected using a network cable and the combo interface goes Up: • After the network cable is removed, the combo interface does not automatically switch to optical mode and remains in electrical mode even if an optical module is installed. In this case, you can run the **combo-port fiber** command to configure the combo interface to work in optical mode. • If an optical module is installed and then the network cable is removed, the combo interface automatically switches to optical mode.	
copper	Configures a combo interface to work in electrical mode so that data is transmitted through network cables.	-
fiber	Configures a combo interface to work in optical mode so that data is transmitted through optical fibers.	-

Views

GE interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Combo interfaces are logic interfaces. One combo interface can work as a GE electrical interface or a GE optical interface. Each combo interface has only one internal forwarding interface. When the electrical interface is enabled, the optical

 Copyright © Huawei Technologies Co., Ltd.

interface is disabled. When the optical interface is enabled, the electrical interface is disabled. Set the working mode of combo interfaces according to network requirements. The electrical and optical interfaces of a combo interface use the same interface view. You can enable the electrical or optical interface, and configure interface attributes such as the rate and duplex mode in the same interface view.

Precautions

This command takes effect only on combo interfaces.

If a combo interface is configured to work in a different mode from the remote interface, the two interfaces cannot communicate.

When a combo interface works in auto mode, to modify the configuration of the electrical or optical interface, you must forcibly configure the combo interface to work in electrical or optical mode.

If you have specified the interface attributes (such as auto-negotiation mode, rate, and duplex mode) on a combo interface, the system may automatically generate the **port media type fiber** and **port media type copper** configurations to determine whether an interface configuration item belongs to the optical interface or electrical interface. If the combo interface works in one mode (such as the electrical mode), the configuration for the other mode (such as the optical mode) will not be lost.

NOTE

When the combo interface of the AR531 series works in optical mode, the interface supports only the non-auto-negotiation mode, and the peer interface must also be configured to work in non-auto-negotiation mode.

For example, after you run the **display this** command on a combo interface, the interface configuration is as follows:

```
#
interface GigabitEthernet0/0/0
 ip address 192.168.1.10 255.255.255.0
 port media type fiber
  undo negotiation auto
  speed 100
 port media type copper
  undo negotiation auto
 combo-port fiber
#
```

The command output shows that there are two configuration items **undo negotiation auto** and **speed 100** when the combo interface works as an optical interface and one configuration item **undo negotiation auto** when the combo interface works as an electrical interface.

Example

Configure GE1/0/0 to work in electrical mode.

```
<Huawei> system-view
[Huawei] interface gigabitethernet 1/0/0
[Huawei-GigabitEthernet1/0/0] combo-port copper
```

 Copyright © Huawei Technologies Co., Ltd.

Related Topics

5.1.10 display this interface

5.2.6 display error-down recovery

Function

The **display error-down recovery** command displays information about the port in error-down state, including the interface name, cause of the error-down event, delay for the interface to change from Down to Up, and remaining time for the Up event.

NOTE

An interface enters the error-down state after being shut down due to an error. Currently, errors include BPDU protection.

Format

display error-down recovery [**interface** *interface-type interface-number*]

Parameters

Parameter	Description	Value
interface *interface-type interface-number*	Displays the specified port in error-down state. • *interface-type* specifies the interface type. • *interface-number* specifies the interface number.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

Usage Scenario

The auto recovery function is configured and the delay for the an interface to change from Down to Up is set using the **error-down auto-recovery** command. If the interface is in the error-down state, you can run the **display error-down recovery** command to view the remaining time for the Up event.

Copyright © Huawei Technologies Co., Ltd.

Prerequisites

The auto recovery function has been configured on an interface using the **error-down auto-recovery** command.

Precautions

If **interface** is not specified in this command, the system displays information about all interfaces in error-down state.

Example

Display the delay for the interface to change from Down to Up and the remaining time for the Up event.

```
<Huawei> display error-down recovery
interface                   error-down cause          recovery   remainder
                                                      time(sec)  time(sec)
--------------------------------------------------------------------------------
Ethernet2/0/0               bpdu-protection           30         10
```

Table 5-13 Description of the **display error-down recovery** command output

Item	Description
interface	Interface name.
error-down cause	Cause of the error-down event, including: • efm-threshold-event • bpdu-protection
recovery time(sec)	Delay for the interface to change from Down to Up, in seconds. If no automatic recovery time is configured, you need to run the **undo shutdown (interface view)** command to make the interface go Up and the recovery time is displayed as --.
remainder time(sec)	Remaining time for the Up event, in seconds. If no automatic recovery time is configured, you need to run the **undo shutdown (interface view)** command to make the interface go Up and the remaining time is displayed as --.

Related Topics

5.2.13 error-down auto-recovery

5.2.7 display interface ethernet brief

Function

The **display interface ethernet brief** command displays brief information about all Ethernet interfaces.

Copyright © Huawei Technologies Co., Ltd.

Format

display interface ethernet brief [**main**]

Parameters

Parameter	Description	Value
main	Displays brief information about all Ethernet main interfaces.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

Usage Scenario

You can use the **display interface ethernet brief** command to view brief information about Ethernet interfaces, including the physical status, auto-negotiation mode, duplex mode, bandwidth, and average inbound and outbound bandwidth usages within the last period of time. This information helps you locate and rectify faults.

Precautions

To clear statistics on an interface, run the **reset counters interface** command.

Example

Display brief information about all Ethernet interfaces.

```
<Huawei> display interface ethernet brief
PHY: Physical
*down: administratively down
(l): loopback
(b): BFD down
^down: standby
(v): VirtualPort
InUti/OutUti: input utility/output utility
Interface                 PHY   Auto-Neg Duplex Bandwidth  InUti OutUti Trunk
Ethernet1/0/0               up    disable  full       100M  0.01%  0.01%    --
Ethernet1/0/1               down  disable  full       100M     0%     0%    --
GigabitEthernet0/0/0        up    enable   full       100M  0.01%  0.01%    --
GigabitEthernet0/0/1        down  enable   full      1000M     0%     0%    --
GigabitEthernet0/0/1.1      down  enable   full      1000M     0%     0%    --
GigabitEthernet0/0/2        up    enable   full      1000M     0%     0%    --
GigabitEthernet0/0/3(v)     up    enable   full      1000M     0%     0%    --
GigabitEthernet0/0/3.1(v)   up    enable   full      1000M     0%     0%    --
```

 Copyright © Huawei Technologies Co., Ltd.

Table 5-14 Description of the **display interface ethernet brief** command output

Item	Description
Interface	Type and number of an interface. All interfaces are displayed in alphabetical order. Information about the following interfaces can be displayed: • Ethernet interface • GE interface • XGE interface If **(v)** is displayed behind an interface number, the interface is a virtual interface.
PHY	Physical status of an interface: • up: indicates that the interface works properly. • down: indicates that the physical layer of the interface fails. • *down: refers to Administratively Down, indicating that the administrator has run the **shutdown (interface view)** command on the interface. • ^down: refers to standby, indicating that this interface is a backup interface. • (l): refers to loopback, indicating that the loopback function is enabled on the interface. • (b): indicates that the physical layer of the interface is in BFD Down state.
Auto-Neg	Whether auto-negotiation is enabled on an interface: • enable: indicates that auto-negotiation is enabled on the interface. • disable: indicates that auto-negotiation is disabled on the interface. To configure the auto-negotiation mode for an interface, run the **negotiation auto** command.
Duplex	Duplex mode of an interface: • full: indicates the full-duplex mode. • half: indicates the half-duplex mode. • In auto-negotiation mode, use the **auto duplex** command to configure the duplex mode of an interface. • In non-auto negotiation mode, use the **duplex** command to configure the duplex mode of an interface.
Bandwidth	Bandwidth on the interface. If the bandwidth value is not 10, 100, or 1000, the value is accurate to three decimal places. For example, if the bandwidth of an interface is 5.696 Mbit/s, this field displays 5.696 Mbit/s. If the bandwidth value is 10, 100, or 1000, decimals are not displayed, and this field displays 10 Mbit/s, 100 Mbit/s, or 1000 Mbit/s.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
InUti	Average inbound bandwidth usage within the last 5 minutes. Average inbound bandwidth usage = Average inbound rate within the last 5 minutes/Interface bandwidth When the average bandwidth usage is smaller than 0.01% and larger than 0, the value 0.01% is displayed. When the interface bandwidth becomes smaller, for example, the bandwidth is changed using the **speed** command, or when an Eth-Trunk member interface becomes Down or is removed from the Eth-Trunk, the bandwidth usage may be displayed as 100% because the communication traffic is not adjusted in time.
OutUti	Average outbound bandwidth usage within the last 5 minutes. Average outbound bandwidth usage = Average outbound rate within the last 5 minutes/Interface bandwidth When the average bandwidth usage is smaller than 0.01% and larger than 0, the value 0.01% is displayed. When the interface bandwidth becomes smaller, for example, the bandwidth is changed using the **speed** command, or when an Eth-Trunk member interface becomes Down or is removed from the Eth-Trunk, the bandwidth usage may be displayed as 100% because the communication traffic is not adjusted in time.
Trunk	Number of the Eth-Trunk to which an interface is added.

Related Topics

5.1.4 display interface

5.1.13 reset counters interface

5.2.8 display port-group

Function

The **display port-group** command displays information about permanent port groups and interfaces in these groups.

Format

display port-group [**all** | *port-group-name*]

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
all	Displays information about all permanent port groups and interfaces in these groups.	-
port-group-name	Displays information about a specified permanent port group and interfaces in the group.	The value is a string of 1 to 32 case-insensitive characters without spaces.

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

When using the **display port-group** command, note that:

- If no parameter is configured, names of all permanent port groups are displayed.
- If **all** is configured, information about all permanent port groups and interfaces in these groups is displayed.
- If *port-group-name* is configured, information about a specified permanent port group and interfaces in the group is displayed.

Example

Display information about all port groups and interfaces in these groups.

```
<Huawei> display port-group all
Portgroup: port1
ethernet2/0/0
ethernet2/0/1
```

Table 5-15 Description of the **display port-group** command output

Item	Description
Portgroup	Name of a permanent port group.

Related Topics

5.2.30 port-group

Copyright © Huawei Technologies Co., Ltd.

5.2.17 group-member

5.2.9 display port-isolate group

Function

The **display port-isolate group** command displays the configuration of a port isolation group.

Format

display port-isolate group { *group-id* | **all** }

Parameters

Parameter	Description	Value
group-id	Displays the configuration of a specified port isolation group.	The value is an integer that ranges from 1 to 64.
all	Displays the configurations of all port isolation groups.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

The port isolation feature isolates interfaces in a VLAN. By adding interfaces to a port isolation group, you can implement Layer 2 isolation between these interfaces. To view the configuration of the port isolation group, run the **display port-isolate group** command.

Example

Display the configurations of all port isolation groups.

```
<Huawei> display port-isolate group all
  The ports in isolate group 1:
Ethernet2/0/0
  The ports in isolate group 2:
Ethernet2/0/1
```

 Copyright © Huawei Technologies Co., Ltd.

Related Topics

5.2.32 port-isolate enable

5.2.10 display snmp-agent trap feature-name error-down all

Function

The **display snmp-agent trap feature-name error-down all** command displays the status of all traps of the error-down module.

Format

display snmp-agent trap feature-name error-down all

Parameters

None

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

Usage Scenario

The Simple Network Management Protocol (SNMP) is a network management standard widely used on the TCP/IP network. It uses a central computer (a network management station) that runs network management software to manage network elements. The SNMP agent reports trap messages to the network management station so that the network management station can obtain the network status in a timely manner, and the network administrator can take measures accordingly.

The **display snmp-agent trap feature-name error-down all** command displays the following information:

- Trap names supported by the error-down module. The trap names are the same as the trap names specified by the **snmp-agent trap enable feature-name error-down trap-name** *trap-name* command. Each trap name corresponds to a network element abnormality.
- Trap status of the error-down module. You can check whether the trap is reported based on the trap name.

Prerequisites

SNMP has been enabled. See **snmp-agent**.

Copyright © Huawei Technologies Co., Ltd.

Example

Display all traps of the error-down module.

```
<Huawei>display snmp-agent trap feature-name error-down all
------------------------------------------------------------------------------
Feature name: ERROR-DOWN
Trap number : 2
------------------------------------------------------------------------------
Trap name                Default switch status   Current switch status
hwErrordown                on                     on
hwErrordownRecovery          on                     on
```

Table 5-16 Description of the display snmp-agent trap feature-name error-down all command output

Item	Description
Feature name	Name of the module that the trap belongs to.
Trap number	Number of traps.
Trap name	Name of the trap: • hwErrordown: indicates an error-down alarm. • hwErrordownRecovery: indicates an error-down clear alarm.
Default switch status	Default status of the trap function: • on: indicates that the trap function is enabled. • off: indicates that the trap function is disabled.
Current switch status	Status of the trap function: • on: indicates that the trap function is enabled. • off: indicates that the trap function is disabled.

Related Topics

5.2.36 snmp-agent trap enable feature-name error-down

5.2.11 duplex

Function

The **duplex** command configures the duplex mode on an Ethernet electrical interface in non-auto-negotiation mode.

The **undo duplex** command restores the default duplex mode on an Ethernet electrical interface in no-auto-negotiation mode.

By default, an Ethernet electrical interface works in full-duplex mode when auto-negotiation is disabled on the interface.

Copyright © Huawei Technologies Co., Ltd.

Format

duplex { **full** | **half** }

undo duplex

Parameters

Parameter	Description	Value
full	Configures the Ethernet interface to work in full-duplex mode when auto-negotiation is disabled on the interface.	-
half	Configures the Ethernet interface to work in half-duplex mode when auto-negotiation is disabled on the interface.	-

Views

Ethernet interface view, GE interface view, port group view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The duplex mode of an interface needs to be set in the following scenarios:

- To enable an interface to send and receive packets at the same time, set the full-duplex mode on the interface.
- To disable an interface from sending and receiving packets at the same time, set the half-duplex mode on the interface.

Prerequisites

The interface works in non-auto negotiation mode.

Precautions

A GE electrical interface that works at 1000 Mbit/s supports only the full-duplex mode. A GE electrical interface and its peer interface do not need to negotiate the duplex mode.

By default, an Ethernet interface works in auto-negotiation mode, which is recommended. If the negotiation succeeds, the two interfaces work at the same duplex mode and speed. The settings of the SPEED and DUPLEX parameters and auto-negotiation mode must be the same at the local and peer ends. Otherwise,

 Copyright © Huawei Technologies Co., Ltd.

negotiation may fail. The interface auto-negotiation mode, duplex mode and speed support depend on the device.

Example

Configure Ethernet electrical interface Eth2/0/0 to work in half-duplex mode when non-auto negotiation is disabled on the interface.

```
<Huawei> system-view
[Huawei] interface ethernet 2/0/0
[Huawei-Ethernet2/0/0] undo negotiation auto
[Huawei-Ethernet2/0/0] duplex half
```

Related Topics

5.1.4 display interface

5.2.22 loopback

5.2.26 mdi

5.2.28 negotiation auto

5.2.37 speed

5.2.12 encapsulation priority-tagged

Function

The **encapsulation priority-tagged** command configures the outbound interface to add a VLAN tag of VLAN 0 to packets and sets the 802.1p priority of packets.

The **undo encapsulation priority-tagged** command disables the outbound interface from adding a VLAN tag of VLAN 0 to packets and deletes the 802.1p priority of packets.

By default, the outbound interface does not add any VLAN tag to packets and retains the original 802.1p priority of packets.

NOTE

Among AR2200 series routers, only the AR2220, AR2220L, AR2220E, AR2240, and AR2240C support this command.

Format

encapsulation priority-tagged [**dot1p** *priority-value* | **dot1p-transmit** *priority-value*]

undo encapsulation priority-tagged [**dot1p** | **dot1p-transmit**]

Parameters

Parameter	Description	Value
dot1p *priority-value*	Sets the 802.1p priority of protocol packets on the outbound interface.	The value is an integer that ranges from 0 to 7. The default value is 0.

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
dot1p-transmit *priority-value*	Sets the 802.1p priority of data packets on the outbound interface.	The value is an integer that ranges from 0 to 7. The default value is 0.

Views

Ethernet interface view, GE interface view, XGE interface view, Layer 3 VE interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

You can run the **encapsulation priority-tagged dot1p** *priority-value* command to configure the outbound interface to add a VLAN tag of VLAN 0 to packets and sets the 802.1p priority of protocol packets.

In the bridge scenario, you can run the **encapsulation priority-tagged dot1p-transmit** *priority-value* command to configure the outbound interface to add a VLAN tag of VLAN 0 to packets and sets the 802.1p priority of data packets.

Prerequisites

Run the **undo ip soft-forward enhance enable** command in the system view to disable the enhanced forwarding function for control packets generated by the device.

Precautions

The **encapsulation priority-tagged dot1p** *priority-value* command can be used only on Layer 3 Ethernet interfaces, GE interfaces, XGE interfaces, VE interfaces.

The **encapsulation priority-tagged dot1p-transmit** *priority-value* command can be used only on Layer 3 Ethernet interfaces, GE interfaces, XGE interfaces.

The **encapsulation priority-tagged dot1p-transmit** *priority-value* command takes effect only in bridge scenarios.

Example

Configure the outbound interface of the Eth2/0/0 to add a VLAN tag of VLAN 0 to packets and set the 802.1p priority of protocol packets to 3.

```
<Huawei> system-view
[Huawei] undo ip soft-forward enhance enable
[Huawei] interface ethernet 2/0/0
[Huawei-Ethernet2/0/0] encapsulation priority-tagged dot1p 3
```

Configure the outbound interface of the Eth2/0/0 to add a VLAN tag of VLAN 0 to packets and set the 802.1p priority of data packets to 3.

```
<Huawei> system-view
[Huawei] undo ip soft-forward enhance enable
```

 Copyright © Huawei Technologies Co., Ltd.

```
[Huawei] interface ethernet 2/0/0
[Huawei-Ethernet2/0/0] encapsulation priority-tagged dot1p-transmit 3
```

5.2.13 error-down auto-recovery

Function

The **error-down auto-recovery** command enables an interface in error-down state to go Up and sets the auto recovery delay.

The **undo error-down auto-recovery** command disables an interface in error-down state from going Up automatically.

By default, an interface in error-down state is not enabled to go Up.

NOTE

An interface enters the error-down state after being shut down due to an error. Currently, errors include BPDU protection.

Format

error-down auto-recovery cause { **bpdu-protection** | **efm-remote-failure** | **efm-threshold-event** } **interval** *interval-value*

undo error-down auto-recovery cause { **bpdu-protection** | **efm-remote-failure** | **efm-threshold-event** } **interval** *interval-value*

Parameters

Parameter	Description	Value
cause	Indicates the cause for an interface in error-down state.	-
bpdu-protection	Indicates that STP BPDU protection is enabled.	-
efm-remote-failure	Indicates that an EFM remote failure event occurs.	-
efm-threshold-event	Indicates that a threshold crossing event occurs.	-

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
interval *interval-value*	Specifies the auto recovery delay.	The value is an integer that ranges from 30 to 86400, in seconds. • A smaller value indicates a higher frequency at which an interface alternates between Up and Down states. • A larger value indicates longer traffic interruption.

Views

System view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

An interface enters the error-down state in the following scenarios.

Cause for an Interface in Error-down State	Scenario	Remarks
bpdu-protection	On an STP-enabled network where BPDU protection is configured on an edge port, if malicious attackers send bogus BPDUs to attack the switching device, the switching device sets the edge port to Down immediately after the edge port receives BPDUs. As a result, all services on the edge port are interrupted.	For details, see **stp bpdu-protection**.

Copyright © Huawei Technologies Co., Ltd.

Cause for an Interface in Error-down State	Scenario	Remarks
efm-remote-failure	The **efm trigger error-down** command associates an error event with an interface. When EFM detects **critical-event**, **dying-gasp**, **link-fault**, or **timeout** faults, the protocol status of the interface becomes Down and all services on the interface are interrupted.	-
efm-threshold-event	When link monitoring is configured for an interface on a link, the link is considered unavailable, if the number of errored frames, errored codes, or errored frame seconds detected by the interface reaches or exceeds the threshold within a period. You can associate an EFM crossing event with an interface. Then the system sets the administrative status of the interface to Down. In this manner, all services on the interface are interrupted.	-

By default, an interface can only be resumed by a network administrator after being shut down. To configure the interface to restore to the Up state automatically, run the **error-down auto-recovery** command to set an auto recovery delay. After the delay, the interface goes Up automatically.

The restored interface is shut down again if the interface receives BPDUs again or the link is considered unavailable in a specified time.

Precautions

The **error-down auto-recovery** command is invalid for the interface that has been in error-down state. It takes effect for only the interface that enters the error-down state after the **error-down auto-recovery** command is executed.

BPDU protection has been enabled using the **stp bpdu-protection** command in the system view.

 Copyright © Huawei Technologies Co., Ltd.

A threshold crossing event has been associated with an interface using the **efm threshold-event trigger error-down** command in the interface view. An error event has been associated with an interface using the **efm trigger error-down** command in the interface view.

Example

Set the delay for an interface changes from Down to Up to 50s after the edge port is enabled with BPDU protection on an STP-enabled network.

```
<Huawei> system-view
[Huawei] error-down auto-recovery cause bpdu-protection interval 50
```

Set the auto recovery delay to 50s after an EFM remote failure event is associated with an interface.

```
<Huawei> system-view
[Huawei] error-down auto-recovery cause efm-remote-failure interval 50
```

Related Topics

5.2.6 display error-down recovery

6.8.23 stp bpdu-protection

5.2.14 error-statistics threshold-event trigger error-down

Function

The **error-statistics threshold-event trigger error-down** command configures an interface to transit to the error-down state when the number of error packets received on the interface reaches the alarm threshold.

The **undo error-statistics threshold-event trigger error-down** command restores the default setting.

By default, an interface does not transit to the error-down state when the number of error packets received on the interface reaches the alarm threshold.

Format

error-statistics threshold-event trigger error-down

undo error-statistics threshold-event trigger error-down

Parameters

None

Views

Interface View

Default Level

2: Configuration level

 Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

Usage Scenario

When an Ethernet interface that has the backup link configured receives error packets, packet loss occurs. To ensure that services are running properly, the interface transits to the error-down state and services are switched to the backup link when the number of error packets received on the interface reaches the alarm threshold.

Follow-up Procedure

By default, an interface that transits to the error-down state can only be restored manually using the **undo shutdown** command. To configure the interface to restore to the Up state automatically, run the **error-down auto-recovery cause error-statistics** command in the system view to set a recovery delay. After the delay, the interface goes Up automatically.

Example

Configure Eth2/0/0 to transit to the error-down state when the number of error packets received on the interface reaches the alarm threshold.

```
<Huawei> system-view
[Huawei] interface ethernet 2/0/0
[Huawei-Ethernet2/0/0] error-statistics threshold-event trigger error-down
```

Related Topics

5.2.39 trap-threshold error-statistics

5.2.13 error-down auto-recovery

5.2.15 flow-control (Ethernet interface view)

Function

The **flow-control** command enables flow control on an Ethernet interface.

The **undo flow-control** command disables flow control on an Ethernet interface.

By default, flow control is disabled on an Ethernet interface.

Format

flow-control

undo flow-control

Parameters

None

Views

Ethernet interface view, GE interface view, XGE interface view

 Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Network congestion causes packet loss. Flow control is a method to prevent packet loss. If network congestion occurs on the local device, the local device sends a message to the remote device, instructing the remote device to reduce the packet sending rate. After receiving the message, the remote device reduces its packet sending rate, which prevents congestion.

Precautions

- If flow control is enabled on an interface, it must also be enabled on the peer interface.
- If the **flow-control negotiation** command has been executed on an Ethernet interface to enable flow control auto-negotiation, running the **flow-control** command on the interface will fail.

Example

Enable flow control on Eth2/0/0.

```
<Huawei> system-view
[Huawei] interface ethernet 2/0/0
[Huawei-Ethernet2/0/0] flow-control
```

Related Topics

5.2.16 flow-control negotiation

5.2.16 flow-control negotiation

Function

The **flow-control negotiation** command enables flow control auto-negotiation on an Ethernet interface.

The **undo flow-control negotiation** command disables flow control auto-negotiation on an Ethernet interface.

By default, flow control auto-negotiation is disabled on an Ethernet interface.

Format

flow-control negotiation

undo flow-control negotiation

Parameters

None

 Copyright © Huawei Technologies Co., Ltd.

Views

GE interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Network congestion causes packet loss. Flow control can prevent packet loss. If congestion occurs on a device, the device sends a message to request the peer device to stop sending packets, which prevents packet loss. Flow control auto-negotiation enables a device to determine whether to enable flow control by negotiating with the peer device.

Prerequisites

The Ethernet interface works in auto-negotiation mode.

Precautions

- If flow control auto-negotiation is enabled on an interface, it must also be enabled on the peer interface.
- If flow control has been enabled on an Ethernet interface using the **flow-control** command, run the **undo flow-control** command to disable flow control before running the **flow-control negotiation** command. Otherwise, the **flow-control negotiation** command fails to be executed.

Example

Enable flow control auto-negotiation on GE1/0/0.

```
<Huawei> system-view
[Huawei] interface gigabitethernet 1/0/0
[Huawei-GigabitEthernet1/0/0] negotiation auto
[Huawei-GigabitEthernet1/0/0] flow-control negotiation
```

Related Topics

5.2.15 flow-control (Ethernet interface view)

5.2.28 negotiation auto

5.2.17 group-member

Function

The **group-member** command adds specified Ethernet interfaces to a permanent port group.

The **undo group-member** command deletes specified Ethernet interfaces from a permanent port group.

By default, no Ethernet interface is added to a permanent port group.

 Copyright © Huawei Technologies Co., Ltd.

Format

group-member { { *interface-type interface-number1* | *interface-type1* } [**to** { *interface-type interface-number2* | *interface-type2* }] } &<1-10>

undo group-member { { *interface-type interface-number1* | *interface-type1* } [**to** { *interface-type interface-number2* | *interface-type2* }] } &<1-10>

undo group-member all-unavailable-interface

Parameters

Parameter	Description	Value
interface-type interface-number1 [**to** *interface-type interface-number2*]	Adds an Ethernet interface to a permanent port group. **to** specifies an interface range, indicating all the interfaces numbered between *interface-number1* and *interface-number2*.	*interface-number2* must be greater than *interface-number1*.
interface-type1 [**to** *interface-type2*]	Adds an Ethernet interface to a permanent port group. **to** specifies an interface range, indicating all the interfaces numbered between *interface-type1* and *interface-type2*.	*interface-type2* must be greater than *interface-type1*.

Views

Port group view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

To perform the same configuration on multiple Ethernet interfaces, add these Ethernet interfaces to a port group and run commands in the port group view to configure the Ethernet interfaces in batches.

Prerequisites

A permanent port group has been created using the **port-group** command in the system view.

Precautions

- The E1-F and CE1/PRI interfaces cannot be added to the same permanent port group.

 Copyright © Huawei Technologies Co., Ltd.

- A maximum of 32 permanent port groups are supported by the system, and a maximum of 48 interfaces can be added to a permanent port group.
- This command has the same function as the **port-group group-member** command that is used in the system view. You can also run the **port-group group-member** command to add interfaces to a temporary port group to configure the interfaces in batches.
- When you specify the keyword **to** in the **group-member** command:
  - The interfaces specified before and after the keyword **to** must reside on the same interface card. To add consecutive interfaces on different interface cards to the same port group, run the **group-member** command or use **to** multiple times.
  - The interfaces specified before and after the keyword **to** must be of the same type such as Ethernet interfaces.
  - The interfaces specified before and after the keyword **to** must have the same attribute. For example, both of them are main interfaces or sub-interfaces. If they are sub-interfaces, they must belong to the same main interface.
  - If **to** is not used, these limitations do not apply.

Example

Add Eth2/0/0 and Eth2/0/1 to port group **portgroup1**.

```
<Huawei> system-view
[Huawei] port-group portgroup1
[Huawei-port-group-portgroup1] group-member ethernet 2/0/0 to ethernet 2/0/1
```

Related Topics

5.2.30 port-group

5.2.8 display port-group

5.2.18 interface (Ethernet interface)

Function

Using the **interface** command, you can enter the specified interface view or sub-interface view.

Format

interface { **ethernet** | **gigabitethernet** | **xgigabitethernet** } *interface-number* [*.subinterface-number*]

Parameters

Parameter	Description	Value
ethernet	Enter the view of an FE interface.	-

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
gigabitethernet	Enter the view of a GE interface.	-
xgigabitethernet	Enter the view of a 10GE interface.	-
interface-number	Specifies the number of an interface.	The value depends on the interface type and slot ID.
subinterface-number	Specifies the number of a sub-interface.	The value is an integer that ranges from 1 to 4096.

Views

System view

Default Level

2: Configuration level

Usage Guidelines

After enter the specified Ethernet interface view, you can set attributes for the Ethernet interface.

You can run the **display device** command to view the slot ID of a card to determine the value range of *interface-number*. Only Layer 3 Ethernet interfaces support sub-interfaces.

Example

Enter the view of Eth2/0/0.

```
<Huawei> system-view
[Huawei] interface ethernet 2/0/0
[Huawei-Ethernet2/0/0]
```

Related Topics

5.1.4 display interface

5.2.19 interface range

Function

The **interface range** command creates a temporary interface group and adds specified interfaces to this temporary interface group. Commands configured for a temporary interface group then automatically run on all member interfaces.

By default, no temporary interface group is created.

Copyright © Huawei Technologies Co., Ltd.

Format

interface range { { *interface-type interface-number1* | *interface-type1* } [**to** { *interface-type interface-number2* | *interface-type2* }] } &<1-10>

Parameters

Parameter	Description	Value
interface-type interface-number1 [**to** *interface-type interface-number2*]	Specifies Ethernet interfaces to be added to a temporary port group. **to** indicates an interface range. All interfaces numbered between *interface-number1* and *interface-number2* are added to the temporary port group.	The value of *interface-number2* must be larger than the value of *interface-number1*.
interface-type1 [**to** *interface-type2*]	Specifies Ethernet interfaces to be added to a temporary port group. **to** indicates an interface range. All interfaces numbered between *interface-type1* and *interface-type2* are added to the temporary port group.	The value of *interface-type2* must be larger than the value of *interface-type1*.

Views

System view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Generally, a device has many Ethernet interfaces and most of them have the same configuration. Configuring these Ethernet interfaces one by one increases the configuration workload and may result in incorrect configurations. Therefore, you can add the Ethernet interfaces to be configured with the same command to a port group. After a command is run in this port group, the system executes the command on all the member interfaces. This process allows Ethernet interfaces to be configured in batches.

Precautions

- The **interface range** and **port-group group-member** commands have the same functions. Therefore, use either of the commands for configuration.
- After exiting from the temporary port group view, the system deletes the temporary port group.

 Copyright © Huawei Technologies Co., Ltd.

- The **interface range** command is equivalent to the **group-member** command executed in the permanent port group view. Multiple interfaces can be added to a permanent port group in batches using the **group-member** command.
- E1-F and CE1/PRI interfaces cannot be added to the same temporary port group.
- The system supports a maximum of 32 temporary port groups. If more than 32 users log in to the device through Telnet simultaneously, only 32 users can create temporary port groups.
- A temporary port group supports a maximum of 48 member interfaces.
- When you specify the keyword **to** in the **interface range** command:
  - The interfaces specified by *interface-number1* and *interface-number2* must reside on the same LPU. To add contiguous interfaces on different LPUs to the same port group, run this command several times or use the keyword **to** several times.
  - The interfaces specified by *interface-number1* and *interface-number2* must be of the same type, for example, both of the interfaces are Ethernet interfaces.
  - The interfaces specified before and after the keyword **to** must have the same attribute. For example, both of them are main interfaces or sub-interfaces. If they are sub-interfaces, they must belong to the same main interface.
  - If **to** is not specified, the preceding limitations do not apply.

Example

Add Eth2/0/0 and 2/0/1 to a temporary port group.

```
<Huawei> system-view
[Huawei] interface range ethernet 2/0/0 to ethernet 2/0/1
[Huawei-port-group]
```

5.2.20 ifg

Function

The **ifg** command configures the inter-frame gap (IFG).

The **undo ifg** command restores the default IFG.

By default, the IFG is 12 bytes.

Format

ifg *ifg-value*

undo ifg

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
ifg-value	Specifies the IFG.	The value is an integer that ranges from 9 to 12, in bytes.

Views

Ethernet interface view, GE interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The IFG is used to differentiate two data packets. The **ifg** command configures the IFG to adjust data packet forwarding efficiency.

NOTE

The packet forwarding rate, also called the throughput, is the data forwarding capability on an interface, expressed in packets per second. The packet forwarding rate is calculated based on the number of 64-byte data packets sent in a certain period. The payload of the frame header and IFG affects the packet forwarding rate.

Precautions

Changing the IFG on an interface is not recommended because this may cause packet loss on the interface.

Example

Set the IFG of Eth2/0/0 to 10 bytes.

```
<Huawei> system-view
[Huawei] interface ethernet 2/0/0
[Huawei-Ethernet2/0/0] ifg 10
```

5.2.21 log-threshold

Function

The **log-threshold** command sets the inbound and outbound bandwidth usage thresholds for generating a log.

The **undo log-threshold** command restores the default inbound and outbound bandwidth usage thresholds for generating a log.

The default inbound and outbound bandwidth usage thresholds for generating a log is 100.

Copyright © Huawei Technologies Co., Ltd.

Format

log-threshold { **input-rate** | **output-rate** } *bandwidth-in-use* [**resume-rate** *resume-threshold*]

undo log-threshold { **input-rate** | **output-rate** }

Parameters

Parameter	Description	Value
input-rate	Specifies the inbound bandwidth.	-
output-rate	Specifies the outbound bandwidth.	-
bandwidth-in-use	Specifies the bandwidth usage threshold for generating a log, prompting for a bandwidth increase request.	The value is an integer that ranges from 1 to 100.
resume-rate *resume-threshold*	Specifies the bandwidth usage threshold for generating a log, indicating that bandwidth usage has been restored.	The value is an integer that ranges from 1 to the value of *bandwidth-in-use*. The default value is the value of *bandwidth-in-use*.

Views

Ethernet interface view, GE interface view, XGE interface view

Default Level

2: Configuration level

Usage Guidelines

Monitoring bandwidth usage helps you learn about current device load. If the bandwidth usage exceeds a configured threshold, a log or an alarm is generated, indicating that bandwidth resources become insufficient and need an increase. For example, if bandwidth usage exceeds 95% of total bandwidth, an alarm is generated, indicating that bandwidth is exhausted. Some services may be interrupted before the bandwidth increases. To help prevent service interruption, setting two bandwidth usage thresholds, one for generating a log and the other for generating an alarm helps you increase bandwidth in time.

NOTE

Outbound bandwidth usage = (Outbound interface rate/Outbound physical interface bandwidth) x 100

Inbound bandwidth usage = (Inbound interface rate/Inbound physical interface bandwidth) x 100

If the offset between the value of *bandwidth-in-use* and the value of *resume-threshold* is too small, log information may be frequently displayed.

 Copyright © Huawei Technologies Co., Ltd.

Example

Configure Eth2/0/0 to generate a log when the outbound interface rate exceeds 80% of the bandwidth.

```
<Huawei> system-view
[Huawei] interface ethernet 2/0/0
[Huawei-Ethernet2/0/0] log-threshold output-rate 80
```

Configure Eth2/0/0 to generate a log when the outbound interface rate exceeds 80% of the bandwidth and to generate a log indicating that bandwidth usage has been restored, when the outbound interface rate is lower than 60% of the bandwidth.

```
<Huawei> system-view
[Huawei] interface ethernet 2/0/0
[Huawei-Ethernet2/0/0] log-threshold output-rate 80 resume-rate 60
```

Related Topics

5.2.38 trap-threshold

5.2.22 loopback

Function

The **loopback** command enables loopback detection on an interface.

The **undo loopback** command disables loopback detection on an interface.

By default, loopback detection is not configured.

Format

loopback internal

undo loopback

Parameters

Parameter	Description	Value
internal	Configures internal loopback detection on a specified interface.	-

Views

Ethernet interface view, GE interface view, XGE interface view, port group view

Default Level

2: Configuration level

 Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

Usage Scenario

Loopback detection can be enabled to test some special functions, for example, locating faults on the Ethernet. After loopback detection is enabled, the Ethernet interface works in full-duplex mode. After loopback detection is disabled, the original duplex mode of the Ethernet interface is restored.

After loopback detection is enabled on an interface, packets sent from the interface are sent back to this interface.

Follow-up Procedure

Run the **display interface** command to check whether the **current status** of the interface configured with internal loopback is Up. If the **current status** of the interface is Up, the internal forwarding function works well; otherwise, a fault occurs during internal forwarding.

Precautions

Loopback detection interrupts the operation of Ethernet interfaces and links. After loopback detection is performed, run the **undo loopback** command to disable loopback detection immediately.

Example

Configure loopback detection on Eth2/0/0.

```
<Huawei> system-view
[Huawei] interface ethernet 2/0/0
[Huawei-Ethernet2/0/0] loopback internal
```

Related Topics

5.1.4 display interface

5.2.23 mac-address (Ethernet interface view)

Function

The **mac-address** command configures a MAC address for an Ethernet interface.

The **undo mac-address** command restores the default MAC address of an Ethernet interface.

By default, the MAC address of an Ethernet interface is the system MAC address.

Format

mac-address *mac-address*

undo mac-address

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
mac-address	Specifies a MAC address for an Ethernet interface.	The value is in the format of H-H-H. Each H is a 4-digit hexadecimal number, such as 00e0 or fc01. The MAC address cannot be FFFF-FFFF-FFFF, all 0s, or a multicast MAC address.

Views

Ethernet interface view, GE interface view, XGE interface view,Ethernet sub-interface view, GE sub-interface view, XGE sub-interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The MAC address of an Ethernet interface is the system MAC address and may conflict with the MAC address of another interface. If the MAC address of an Ethernet interface conflicts with that of another interface, a loop may occur or traffic may fail to be forwarded.

You can run the **mac-address** command to change the MAC address of the Ethernet interface to ensure that service data flows are properly forwarded.

Configuration Impact

After the MAC address of an Ethernet interface is changed, the device proactively sends gratuitous ARP packets to update ARP entries on the remote device.

Precautions

This command can be configured only on Layer 3 Ethernet interfaces.

Example

Set the MAC address of GE1/0/0 to 0001-2345-abcd.

```
<Huawei> system-view
[Huawei] interface gigabitethernet 1/0/0
[Huawei-GigabitEthernet1/0/0] mac-address 0001-2345-abcd
```

Related Topics

5.1.4 display interface

Copyright © Huawei Technologies Co., Ltd.

5.2.24 management-plane isolate enable

Function

The **management-plane isolate enable** command disables the device from accessing the IP address of the management port from service ports.

The **undo management-plane isolate enable** command enables the device to access the IP address of the management port from service ports.

By default, the device is disabled from accessing the IP address of the management port from service ports.

NOTE

Only the AR2204EX, AR2240 (configured with the SRU100E, SRU200, SRU200E, and SRU400), AR3260 (configured with the SRU200, SRU200E, and SRU400) and AR3670 (configured with the SRUX5) support this command.

Format

management-plane isolate enable

undo management-plane isolate enable

Parameters

None

Views

System view

Default Level

3: Management level

Usage Guidelines

Usage Scenario

You can run the **management-plane isolate enable** command on the device so that the service port will discard the packets whose destination address is the management port address. This improves network security and prevents attacks between the management port through the service ports. However, the device can access the IP address of service ports from the management port.

Precautions

The **management-port isolate enable** and **management-plane isolate enable** command functions are different. The **management-port isolate enable** command isolates traffic between the management port and service ports by marking the network segment routes with the outbound interface being the management port as the blackhole routes, whereas the **management-plane isolate enable** command isolates service ports from the management port by

Copyright © Huawei Technologies Co., Ltd.

marking the host and broadcast routes with the outbound interface being the management port as the blackhole routes.

Example

Enable the device to access the IP address of a management port from service ports.

```
<Huawei> system-view
[Huawei] undo management-plane isolate enable
```

Related Topics

5.2.25 management-port isolate enable

5.2.25 management-port isolate enable

Function

The **management-port isolate enable** command enables forwarding traffic isolation between the management port and service ports.

The **undo management-port isolate enable** command disables forwarding traffic isolation between the management port and service ports.

By default, forwarding traffic isolation is enabled between the management port and service ports.

NOTE

Only the AR2204EX, AR2240 (configured with the SRU100E, SRU200, SRU200E, and SRU400), AR3260 (configured with the SRU200, SRU200E, and SRU400) and AR3670 (configured with the SRUX5) support this command.

Format

management-port isolate enable

undo management-port isolate enable

Parameters

None

Views

System view

Default Level

3: Management level

Usage Guidelines

Usage Scenario

 Copyright © Huawei Technologies Co., Ltd.

You can run the **management-port isolate enable** command on the device to restrict packet traffic between the management port and service ports. That is, the packets received on the management port will not be forwarded from service ports; similarly, the packets received on service ports will not be forwarded from the management port. This improves network security and prevents attacks on the management port from service ports.

Precautions

The **management-port isolate enable** and **management-plane isolate enable** command functions are different. The **management-port isolate enable** command isolates traffic between the management port and service ports by marking the network segment routes with the outbound interface being the management port as the blackhole routes, whereas the **management-plane isolate enable** command isolates service ports from the management port by marking the host and broadcast routes with the outbound interface being the management port as the blackhole routes.

Example

Disable forwarding traffic isolation between the management port and service ports.

```
<Huawei> system-view
[Huawei] undo management-port isolate enable
```

Related Topics

5.2.24 management-plane isolate enable

5.2.26 mdi

Function

The **mdi** command configures the medium dependent interface (MDI) mode of an Ethernet electrical interface.

The **undo mdi** command restores the default MDI mode of an Ethernet electrical interface.

By default, an Ethernet electrical interface automatically identifies the network cable type.

Format

mdi { **across** | **auto** | **normal** }

undo mdi

Parameters

Parameter	Description	Value
across	Sets the MDI mode of an Ethernet electrical interface to **across**.	-

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
auto	Sets the MDI mode of an Ethernet electrical interface to **auto**. An Ethernet electrical interface automatically identifies the network cable type.	-
normal	Sets the MDI mode of an Ethernet electrical interface to **normal**.	-

Views

Ethernet interface view, GE interface view, port group view

Default Level

2: Configuration level

Usage Guidelines

An Ethernet interface consists of eight pins. Each pin has its functions. For example, pins 1 and 2 send signals, and pins 3 and 6 receive signals. By setting the MDI mode for an interface, you can change the roles of pins in communication so that the interface adapts to the actual network cable type.

Setting the MDI mode to **auto** is recommended because the auto mode applies to most scenarios. When the network cable type parameters cannot be obtained, set the MDI mode to **across** or **normal** manually.

The methods to set the MDI mode manually are as follows:

- When straight-through network cables are used, the MDI modes of the interfaces on the local and peer devices must be different. For example, you can set the MDI mode of the interface on the local device to **across** and the MDI mode of the interface on the peer device to **normal**.
- When crossover network cables are used, the MDI modes of the interfaces on the local and peer devices must be the same. For example, you can set the MDI modes of the interfaces on the local and peer devices to **across** or **normal**. Alternatively, the MDI type of the interface on a device is **auto** and the MDI type of the interface on the other device can be set to **across** or **normal**.

Example

Set the MDI mode of Eth2/0/0 to **across**.

```
<Huawei> system-view
[Huawei] interface ethernet 2/0/0
[Huawei-Ethernet2/0/0] mdi across
```

 Copyright © Huawei Technologies Co., Ltd.

Related Topics

5.2.11 duplex

5.2.28 negotiation auto

5.2.27 mtu (Ethernet interface view)

Function

The **mtu** command sets the maximum transmission unit (MTU) for an Ethernet interface.

The **undo mtu** command restores the default MTU of an Ethernet interface.

By default, the MTU of an Ethernet interface is 1500 bytes.

Format

mtu *mtu*

undo mtu

Parameters

Parameter	Description	Value
mtu	Specifies the MTU of an Ethernet interface.	The value depends on the device.

Views

Ethernet interface view, GE interface view, XGE interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The size of data packets is limited at the network layer. Upon receiving an IP packet to be sent, the network layer checks to which local interface the packet needs to be sent and obtains the maximum transmission unit (MTU) configured on the interface. Then the network layer compares the MTU with the packet length. If the packet length is longer than the MTU, the network layer disassembles the packet to fragments, each no longer than the MTU.

- If the MTU is too small whereas the packet size is large, the packet is split into many fragments. Therefore, the packet may be discarded due to insufficient QoS queue length.
- If the MTU is too large, packets are transmitted slowly or even lost.

Precautions

Copyright © Huawei Technologies Co., Ltd.

- If you run the **mtu** command multiple times in the same Ethernet interface view, only the latest configuration takes effect.
- This command can only be used on Layer 3 Ethernet interfaces.

Example

Set the MTU of GE1/0/0 to 1200 bytes.

```
<Huawei> system-view
[Huawei] interface gigabitethernet 1/0/0
[Huawei-GigabitEthernet1/0/0] mtu 1200
```

Related Topics

5.1.4 display interface

5.2.28 negotiation auto

Function

The **negotiation auto** command configures an Ethernet interface to work in auto-negotiation mode.

The **undo negotiation auto** command configures an Ethernet interface to work in non-auto-negotiation mode.

By default, an Ethernet interface works in auto-negotiation mode.

Format

negotiation auto

undo negotiation auto

Parameters

None

Views

MEth interface view, Ethernet interface view, GE interface view, XGE interface view, port group view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Earlier Ethernet worked in 10M half-duplex mode and required mechanisms such as Carrier Sense Multiple Access (CSMA)/Collision Detection (CD) to ensure system stability. As Ethernet technology develops, full-duplex Ethernet and 100 Mbit/s Ethernet emerge. This greatly improves Ethernet performance. Auto-

 Copyright © Huawei Technologies Co., Ltd.

negotiation technology allows new Ethernet to be compatible with earlier Ethernet. In auto-negotiation mode, interfaces on both ends of a link negotiate their operating parameters, including the duplex mode and rate. If the negotiation succeeds, the two interfaces work at the same operating parameters.

You can configure an interface to work in auto-negotiation mode only when interfaces on both ends support the auto-negotiation mode.

- If interfaces on both ends support auto-negotiation and are required to work in auto-negotiation mode, run the **negotiation auto** command.
- If one of the two interfaces does not support auto-negotiation or is not required to work in auto-negotiation mode, run the **undo negotiation auto** command.

Precautions

- By default, an Ethernet interface works in auto-negotiation mode, which is recommended. If the negotiation succeeds, the two interfaces work at the same duplex mode and speed. The settings of the SPEED and DUPLEX parameters and auto-negotiation mode must be the same at the local and peer ends. Otherwise, negotiation may fail. The interface auto-negotiation mode, duplex mode and speed support depend on the device.
- By default, GE interfaces do not support flow control auto-negotiation. You can run the **flow-control negotiation** command to configure flow control auto-negotiation.
- GE optical interfaces do not support auto-negotiation function after FE optical modules are installed on the interfaces.

Example

Configure Eth2/0/0 to work in non-auto-negotiation mode.

```
<Huawei> system-view
[Huawei] interface ethernet 2/0/0
[Huawei-Ethernet2/0/0] undo negotiation auto
```

Related Topics

5.2.11 duplex

5.2.26 mdi

5.2.37 speed

5.2.29 port-down holdoff-timer

Function

The **port-down holdoff-timer** command sets the delay time for an interface to report the Down event.

The **undo port-down holdoff-timer** command configures an interface to report the Down event immediately.

By default, an interface reports the Down event immediately.

 Copyright © Huawei Technologies Co., Ltd.

Format

port-down holdoff-timer *holdoff-timer*

undo port-down holdoff-timer

Parameters

Parameter	Description	Value
holdoff-timer	Specifies the delay time for an interface to report the Down event.	The value is an integer that ranges from 50 to 3000, in milliseconds.

Views

Ethernet interface view, GE interface view, XGE interface view

Default Level

2: Configuration level

Usage Guidelines

When an interface becomes Down, services on the interface are interrupted even if this interface becomes Up soon. To prevent services from being interrupted, set the delay in reporting a Down event on the interface so that the system still considers that this interface is in Up state within the delay time.

Example

Set the delay time for an interface to report the Down event to 100 ms.

```
<Huawei> system-view
[Huawei] interface ethernet 2/0/0
[Huawei-Ethernet2/0/0] port-down holdoff-timer 100
```

5.2.30 port-group

Function

The **port-group** command creates a permanent port group and displays the permanent port group view.

The **undo port-group** command deletes permanent port groups.

By default, no permanent port group is configured.

Format

port-group *port-group-name*

undo port-group { **all** | *port-group-name* }

 Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
port-group-name	Specifies the name of a permanent port group.	The value is a string of 1 to 32 case-insensitive characters without spaces. **NOTE** A permanent port group cannot be named **group**.
all	Deletes all port groups.	-

Views

System view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Generally, a device has many interfaces and most of them have the same configuration. Configuring these interfaces one by one increases the configuration workload and may result in incorrect configurations. You can add the interfaces to be configured with the same commands to a permanent port group. After a command is run in this port group, the system executes the command on all the member interfaces. This process allows interfaces to be configured in batches.

Follow-up Procedure

Run the **group-member** command to add Ethernet interfaces to the created permanent port group.

Precautions

- The *port-group-name* parameter cannot be set to **all**.
- The system supports a maximum of 32 permanent port groups and each port group supports a maximum of 48 member interfaces.

Example

Create port group **portgroup1** and enter the port group view.

```
<Huawei> system-view
[Huawei] port-group portgroup1
[Huawei-port-group-portgroup1]
```

Related Topics

5.2.8 display port-group

5.2.17 group-member

Copyright © Huawei Technologies Co., Ltd.

5.2.31 port-group group-member

Function

The **port-group group-member** command creates a temporary port group and adds specified Ethernet interfaces to the temporary port group. Commands configured for a temporary port group will be automatically run on all member interfaces.

By default, no temporary port group is created.

Format

port-group group-member { { *interface-type interface-number1* | *interface-type1* } [**to** { *interface-type interface-number2* | *interface-type2* }] } &<1-10>

Parameters

Parameter	Description	Value
interface-type interface-number1 [**to** *interface-type interface-number2*]	Specifies Ethernet interfaces to be added to a temporary port group. **to** indicates an interface range. All interfaces numbered between *interface-number1* and *interface-number2* are added to the temporary port group.	The value of *interface-number2* must be larger than the value of *interface-number1*.
interface-type1 [**to** *interface-type2*]	Specifies Ethernet interfaces to be added to a temporary port group. **to** indicates an interface range. All interfaces numbered between *interface-type1* and *interface-type2* are added to the temporary port group.	The value of *interface-type2* must be larger than the value of *interface-type1*.

Views

System view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Generally, a device has many Ethernet interfaces and most of them have the same configuration. Configuring these Ethernet interfaces one by one increases the configuration workload and may result in incorrect configurations. Therefore, you

Copyright © Huawei Technologies Co., Ltd.

can add the Ethernet interfaces to be configured with the same command to a port group. After a command is run in this port group, the system executes the command on all the member interfaces. This process allows Ethernet interfaces to be configured in batches.

Precautions

- After exiting from the temporary port group view, the system deletes the temporary port group.
- The **port-group group-member** command is equivalent to the **group-member** command executed in the permanent port group view. Multiple interfaces can be added to a permanent port group in batches using the **group-member** command.
- E1-F and CE1/PRI interfaces cannot be added to the same temporary port group.
- The system supports a maximum of 32 temporary port groups. If more than 32 users log in to the device through Telnet simultaneously, only 32 users can create temporary port groups.
- A temporary port group supports a maximum of 48 member interfaces.
- When you specify the keyword **to** in the **port-group group-member** command:
  - The interfaces specified by *interface-number1* and *interface-number2* must reside on the same LPU. To add contiguous interfaces on different LPUs to the same port group, run this command several times or use the keyword **to** several times.
  - The interfaces specified by *interface-number1* and *interface-number2* must be of the same type, for example, both of the interfaces are Ethernet interfaces.
  - The interfaces specified before and after the keyword **to** must have the same attribute. For example, both of them are main interfaces or sub-interfaces. If they are sub-interfaces, they must belong to the same main interface.
  - If **to** is not specified, the preceding limitations do not apply.

Example

Add Eth2/0/0 and Eth2/0/1 to a temporary port group.

```
<Huawei> system-view
[Huawei] port-group group-member ethernet 2/0/0 to ethernet 2/0/1
[Huawei-port-group]
```

Related Topics

5.2.30 port-group

5.2.17 group-member

5.2.32 port-isolate enable

Function

The **port-isolate enable** command enables port isolation.

 Copyright © Huawei Technologies Co., Ltd.

The **undo port-isolate enable** command disables port isolation.

By default, port isolation is disabled.

Format

port-isolate enable [**group** *group-id*]

undo port-isolate enable [**group** *group-id*]

Parameters

Parameter	Description	Value
group *group-id*	Specifies the ID of a port isolation group.	The value is an integer depending on the device.

Views

Ethernet interface view, GE interface view, Eth-Trunk interface view, port group view, XGE interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

To implement Layer 2 isolation between interfaces, add different interfaces to different VLANs. This, however, wastes VLAN resources. To save VLAN resources, enable port isolation to isolate interfaces in a VLAN. That is, you can add interfaces to a port isolation group to implement Layer 2 isolation between these interfaces. Port isolation provides secure and flexible networking schemes for customers.

Precautions

- After port isolation is configured, ports are isolated at Layer 2 but can communicate at Layer 3 by default. To configure both Layer 2 isolation and Layer 3 isolation, run the **port-isolate mode all** command.
- Interfaces in a port isolation group are isolated from each other, but interfaces in different port isolation groups can communicate. If *group-id* is not specified, interfaces are added to port isolation group 1 by default.
- Inter-board port isolation is not supported on the interfaces of the 4GE-2S, 9ES2, 4ES2G-S or 4ES2GP-S interface card.
- The AR100&AR120&AR150&AR160&AR200 series, AR1200 series, AR2220E, AR2201-48FE, AR2202-48FE, AR2204-51GE-P, AR2204-51GE-R, AR2204-27GE-P, AR2204-27GE, AR2204E, AR2204E-D, and AR2204 only support isolation at Layer 2 and interworking at Layer 3. GE0/0/3 to GE0/0/26 on the AR2204-51GE-P and AR2204-51GE-R cannot be isolated from GE0/0/27 to GE0/0/50.

 Copyright © Huawei Technologies Co., Ltd.

Example

Enable port isolation on Eth2/0/0.

```
<Huawei> system-view
[Huawei] interface ethernet 2/0/0
[Huawei-Ethernet2/0/0] port-isolate enable group 1
```

Related Topics

5.2.9 display port-isolate group

5.2.33 port-isolate mode

Function

The **port-isolate mode** command sets the port isolation mode.

By default, ports are isolated at Layer 2 but can communicate at Layer 3.

NOTE

The AR100&AR120&AR150&AR160&AR200 series, AR1200 series, AR2220E, AR2201-48FE, AR2202-48FE, AR2204-51GE-P, AR2204-51GE-R, AR2204-27GE-P, AR2204-27GE, AR2204E, AR2204E-D, and AR2204 only support isolation at Layer 2 and interworking at Layer 3. GE0/0/3 to GE0/0/26 on the AR2204-51GE-P and AR2204-51GE-R cannot be isolated from GE0/0/27 to GE0/0/50.

Format

port-isolate mode { **l2** | **all** }

Parameters

Parameter	Description	Value
l2	Indicates that ports are isolated at Layer 2 but can communicate at Layer 3.	-
all	Indicates that ports are isolated at both Layer 2 and Layer 3.	-

Views

System view

Default Level

2: Configuration level

 Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

Usage Scenario

To disable members in a port isolation group from communicating at Layer 2 but allow them to access public resources, such as printer and server, run the **port-isolate mode** command to set the port isolation mode to **l2**.

To disable members in a port isolation group from communicating at both Layer 2 and Layer 3, run the **port-isolate mode** command to set the port isolation mode to **all**.

Precautions

- To isolate ports at both Layer 2 and Layer 3, run the **port-isolate mode all** command.
- To isolate ports at Layer 2 but allow them to communicate at Layer 3, run the **port-isolate mode l2** command.

Example

Configure Layer 2 isolation and Layer 3 communication.

```
<Huawei> system-view
[Huawei] port-isolate mode l2
```

Related Topics

5.2.9 display port-isolate group

5.2.32 port-isolate enable

5.2.34 portswitch

Function

The **portswitch** command changes the working mode of Ethernet interfaces from Layer 3 mode to Layer 2 mode.

The **undo portswitch** command changes the working mode of Ethernet interfaces from Layer 2 mode to Layer 3 mode.

By default, an Ethernet interface works in Layer 2 mode.

Copyright © Huawei Technologies Co., Ltd.

NOTE

Eth0/0/0 to Eth0/0/3 on the AR120 (except the AR129CV, AR129CVW, and AR129CGVW-L) and AR150 series can be changed from Layer 2 mode to Layer 3 mode.

GE0/0/0 to GE0/0/3 on the AR100 series, AR129CV, AR129CVW, AR129CGVW-L, and AR160 series can be changed from Layer 2 mode to Layer 3 mode.

Eth0/0/0 to Eth0/0/7 on the AR200 series, AR1220, AR1220V, AR1220W, AR1220VW, and AR1220F can be changed from Layer 2 mode to Layer 3 mode.

GE0/0/0 to GE0/0/7 on the AR1220C, AR1220E, AR1220EV, and AR1220EVW can be changed from Layer 2 mode to Layer 3 mode.

Eth0/0/0 and Eth0/0/47 on the AR2201-48FE and AR2202-48FE can be changed from Layer 2 mode to Layer 3 mode.

GE0/0/3 to GE0/0/50 on the AR2204-51GE-P, AR2204-51GE-R, and AR2204-51GE can be changed from Layer 2 mode to Layer 3 mode.

GE0/0/3 to GE0/0/26 on the AR2204-27GE-P, AR2204E-D-27GE, and AR2204-27GE can be changed from Layer 2 mode to Layer 3 mode.

The working modes of all interfaces on the 24GE Ethernet LAN cards can be changed from Layer 2 mode to Layer 3 mode. After the reserved VLAN ID of the 9ES2 Ethernet LAN card (excluding the 9ES2 Ethernet LAN card, 8FE1GE Ethernet electrical interface card, and 4ES2G-S Ethernet LAN card installed on the AR1200 series router) is delivered using the **set reserved-vlan** command, the working modes of all interfaces on the card can be changed from Layer 2 mode to Layer 3 mode.

AR2220E, AR2240, and AR3260 can run the **portswitch** command to change the working mode of all interfaces on the SRU200, SRU400, 4GECS, and 2X10GL from Layer 3 mode to Layer 2 mode. The interfaces that change the working mode to layer 2 only support VXLAN.

Format

portswitch

undo portswitch

Parameters

None

Views

Ethernet interface view, GE interface view, Eth-Trunk interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

By default, an Ethernet interface on the device works in Layer 2 mode. To enable Layer 3 functions on the interface, run the **undo portswitch** command on the interface.

Precautions

The minimum interval between running the **portswitch** and **undo portswitch** commands must be 30s.

 Copyright © Huawei Technologies Co., Ltd.

Example

Change the working mode of Eth0/0/0 from Layer 2 mode to Layer 3 mode.

```
<Huawei> system-view
[Huawei] interface ethernet 0/0/0
[Huawei-Ethernet0/0/0] undo portswitch
```

5.2.35 set flow-statistics include-interframe

Function

The **set flow-statistics include-interframe** command configures traffic statistics on an interface to contain the inter-frame gap and preamble.

The **undo set flow-statistics include-interframe** command configures traffic statistics on an interface not to contain the inter-frame gap and preamble.

By default, traffic statistics on an interface do not contain the inter-frame gap and preamble.

Format

set flow-statistics include-interframe

undo set flow-statistics include-interframe

Parameters

None

Views

Ethernet interface view, GE interface view, XGE interface view, Eth-Trunk interface view, port group view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The QoS function counts the inter-frame gap when calculating the traffic rate on an interface, but the traffic statistics on the interface do not contain the inter-frame gap. Therefore, the traffic statistics collected on an interface are different from the traffic statistics of rate limit on the interface. To solve this problem, configure the traffic statistics on an interface to contain the inter-frame gap.

Precautions

The device counts bytes in the inter-frame gap when collecting traffic statistics on a sub-interface. By default, the device does not count bytes in the inter-frame gap when collecting traffic statistics on a main interface. Therefore, traffic statistics on a main interface differ from those on its sub-interface. You can run the **set flow-**

 Copyright © Huawei Technologies Co., Ltd.

statistics include-interframe command on the main interface to configure the device to count bytes in the inter-frame gap and preamble when collecting traffic statistics on the main interface.

Example

Configure traffic statistics on Eth2/0/0 to contain the inter-frame gap and preamble.

```
<Huawei> system-view
[Huawei] interface ethernet 2/0/0
[Huawei-Ethernet2/0/0] set flow-statistics include-interframe
```

Related Topics

5.1.4 display interface

5.2.36 snmp-agent trap enable feature-name error-down

Function

The **snmp-agent trap enable feature-name error-down** command enables the trap function for the errordown module.

The **undo snmp-agent trap enable feature-name error-down** command disables the trap function for the errordown module.

By default, the trap function is disabled for the errordown module.

Format

snmp-agent trap enable feature-name error-down [**trap-name** *trap-name*]

undo snmp-agent trap enable feature-name error-down [**trap-name** *trap-name*]

Parameters

Parameter	Description	Value
trap-name *trap-name*	Indicates the trap function for a specified type of trap messages of the errordown module: • hwerrordown: indicates an errordown alarm. • hwerrordownrecovery: indicates an errordown clear alarm.	-

Views

System view

Default Level

3: Management level

 Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

You can specify **trap-name** to enable the trap function for one or more events of the errordown module.

Example

Enable the trap function for errordown alarms.

```
<Huawei> system-view
[Huawei] snmp-agent trap enable feature-name error-down trap-name hwerrordown
```

Related Topics

5.2.10 display snmp-agent trap feature-name error-down all

5.2.37 speed

Function

The **speed** command sets the rate for an Ethernet interface in non-auto negotiation mode.

By default, an Ethernet interface works at its highest rate when it works in non-auto negotiation mode. Specially, when a GE electrical interface works in non-auto-negotiation mode, its default rate is 100 Mbit/s, not the maximum rate 1000 Mbit/s supported by the GE interface.

NOTE

The rate range depends on the device.

Format

speed { **10** | **100** | **1000** | **10000** }

Parameters

Parameter	Description	Value
10	Indicates that the interface works at 10 Mbit/s.	-
100	Indicates that the interface works at 100 Mbit/s.	-
1000	Indicates that the interface works at 1000 Mbit/s.	-
10000	Indicates that the interface works at 10000 Mbit/s.	-

Copyright © Huawei Technologies Co., Ltd.

Views

Ethernet interface view, GE interface view, XGE interface view, port group view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

In non-auto negotiation mode, if interfaces on two connected devices work at different rates, use the **speed** command to change the rates of the interfaces to be the same so that the two devices can communicate.

Precautions

By default, an Ethernet interface works in auto-negotiation mode, which is recommended. If the negotiation succeeds, the two interfaces work at the same duplex mode and speed. The settings of the SPEED and DUPLEX parameters and auto-negotiation mode must be the same at the local and peer ends. Otherwise, negotiation may fail. The interface auto-negotiation mode, duplex mode and speed support depend on the device.

If the remote interface does not support the auto negotiation mode, run the **undo negotiation auto** command on the local interface to configure the interface to work in non-auto negotiation mode. You can then change the rate of the local interface to be the same as the rate of the remote interface to ensure proper communication.

Example

Configure GE2/0/0 to work at 100 Mbit/s in non-auto negotiation mode.

```
<Huawei> system-view
[Huawei] interface gigabitethernet 2/0/0
[Huawei-GigabitEthernet2/0/0] undo negotiation auto
[Huawei-GigabitEthernet2/0/0] speed 100
```

Related Topics

5.2.28 negotiation auto

5.2.11 duplex

5.2.38 trap-threshold

Function

The **trap-threshold** command sets the inbound and outbound bandwidth usage thresholds for generating a trap.

The **undo trap-threshold** command restores the default inbound and outbound bandwidth usage thresholds for generating a trap.

The default inbound or outbound bandwidth usage threshold for generating a trap is 100.

 Copyright © Huawei Technologies Co., Ltd.

Format

trap-threshold { **input-rate** | **output-rate** } *bandwidth-in-use* [**resume-rate** *resume-threshold*]

undo trap-threshold { **input-rate** | **output-rate** }

Parameters

Parameter	Description	Value
input-rate	Indicates inbound bandwidth.	-
output-rate	Indicates outbound bandwidth.	-
bandwidth-in-use	Specifies the bandwidth usage threshold for generating a trap.	The value is an integer that ranges from 1 to 100.
resume-rate *resume-threshold*	Specifies the bandwidth usage threshold for clearing a trap.	The value is an integer that ranges from 1 to *bandwidth-in-use*. The default value is *bandwidth-in-use*.

Views

Ethernet interface view, GE interface view, XGE interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The bandwidth usage represents the load on a device. If the bandwidth usage exceeds the threshold, bandwidth of the device is insufficient for services and needs expansion. For example, if the bandwidth usage exceeds 95%, an alarm is generated to indicate that bandwidth resources are used up. Services may be interrupted before system expansion. You can set the upper and lower thresholds for bandwidth usage. When the bandwidth usage exceeds the lower threshold, the system generates a log. When the bandwidth usage exceeds the upper threshold, the system triggers an alarm.

NOTE

Outbound bandwidth usage = (Outbound interface rate/Outbound physical interface bandwidth) x 100

Inbound bandwidth usage = (Inbound interface rate/Inbound physical interface bandwidth) x 100

The interface rate and bandwidth are expressed in bits per second.

The interval for collecting statistics on the traffic rate on an interface is the value configured using the **set flow-stat interval** command on the interface.

Copyright © Huawei Technologies Co., Ltd.

To set a lower threshold, run the **log-threshold** command.

The **trap-threshold** command sets the bandwidth usage threshold for generating a trap. The **trap-threshold** with the following parameters provides various functions:

- **trap-threshold input-rate** *bandwidth-in-use* **resume-rate** *resume-threshold*: sets the inbound bandwidth usage threshold for generating a trap.
  - If inbound bandwidth usage exceeds the threshold specified in *bandwidth-in-use*, an hwIfMonitorInputRateRising trap is generated, indicating that inbound bandwidth usage exceeds the configured threshold.
  - If inbound bandwidth usage falls below the threshold specified in *resume-threshold*, an hwIfMonitorInputRateResume trap is generated, indicating that inbound bandwidth usage falls between the configured threshold for clearing a trap.
- **trap-threshold output-rate** *bandwidth-in-use* **resume-rate** *resume-threshold*: sets the outbound bandwidth usage threshold for generating a trap.
  - If outbound bandwidth usage exceeds the threshold specified in *bandwidth-in-use*, an hwIfMonitorOutputRateRising trap is generated, indicating that outbound bandwidth usage exceeds the configured threshold.
  - If outbound bandwidth usage falls below the threshold specified in *resume-threshold*, an hwIfMonitorOutputRateResume trap is generated, indicating that outbound bandwidth usage falls between the configured threshold for clearing a trap.

Precautions

- When the bandwidth usage exceeds the threshold for generating a trap, the system generates a trap. When the bandwidth usage falls below the threshold for clearing a trap, the system clears the trap.
- If the offset between the value of *bandwidth-in-use* and the value of *resume-threshold* is too small, trap information may be frequently displayed.
- The log threshold must be lower than the trap threshold, providing efficient protection for services. For example, when the inbound bandwidth usage reaches 80%, a log is generated. If the inbound bandwidth usage continues to increase and reaches 95%, a trap is generated. This ensures that a log is generated for inbound bandwidth usage of 80%, and a trap is generated for inbound bandwidth usage of 95%. Either the log or the trap prompts for a bandwidth increase, preventing service interruption.

Example

Configure Eth2/0/0 to generate a trap when the outbound bandwidth usage exceeds 60%.

```
<Huawei> system-view
[Huawei] interface ethernet 2/0/0
[Huawei-Ethernet2/0/0] trap-threshold output-rate 60
```

Configure Eth2/0/0 to generate a trap when the outbound bandwidth usage exceeds 80% and clear the trap when the outbound bandwidth usage falls below 60%.

 Copyright © Huawei Technologies Co., Ltd.

```
<Huawei> system-view
[Huawei] interface ethernet 2/0/0
[Huawei-Ethernet2/0/0] trap-threshold output-rate 80 resume-rate 60
```

Related Topics

5.2.21 log-threshold

21.1.30 snmp-agent trap enable

5.2.39 trap-threshold error-statistics

Function

The **trap-threshold error-statistics** command sets the alarm threshold for error packets and alarm interval.

The **undo trap-threshold error-statistics** command restores the default alarm threshold for error packets and default alarm interval.

By default, the alarm threshold for error packets is 3 and the alarm interval is 10 seconds.

Format

trap-threshold error-statistics *threshold-value* **interval** *interval-value*

undo trap-threshold error-statistics

Parameters

Parameter	Description	Value
threshold-value	Sets the alarm threshold for error packets.	The value is an integer that ranges from 1 to 65535.
interval *interval-value*	Sets the interval for reporting alarms for error packets.	The value is an integer that ranges from 10 to 65530 and must be a multiple of 10, in seconds.

Views

Ethernet interface view, GE interface view, XGE interface view

Default Level

2: Configuration level

Usage Guidelines

The system generates an alarm when the number of error packets received by an interface within an alarm interval exceeds the alarm threshold. If the number of

Copyright © Huawei Technologies Co., Ltd.

received error packets is 0 in the next alarm interval, the system displays an alarm clearance message.

Example

Set the alarm threshold for error packets on Eth2/0/0 to 10 and the alarm interval to 30 seconds.

```
<Huawei> system-view
[Huawei] interface ethernet 2/0/0
[Huawei-Ethernet2/0/0] trap-threshold error-statistics 10 interval 30
```

5.2.40 virtual-cable-test

Function

The **virtual-cable-test** command tests the cable connected to an Ethernet electrical interface and displays the test result.

Format

virtual-cable-test

Parameters

None

Views

Ethernet interface view, GE interface view

Default Level

3: Management level

Usage Guidelines

Usage Scenario

You can run the **virtual-cable-test** command to check whether the cable works properly. According to the command output, you can locate and rectify cable faults.

- If the cable works properly, the total length of the cable is displayed.
- If the cable cannot work properly, the distance between the interface and the fault point is displayed.

Precautions

- The distance error generated during VCT detection is about 10 m. The test result is only for reference and may be inaccurate for cables of some vendors.
- Running the **virtual-cable-test** command may affect services on the interface in a short period of time.
- Combo electrical interfaces support cable tests.

 Copyright © Huawei Technologies Co., Ltd.

- Before performing a cable test, shut down the remote interface or remove the network cable from the remote interface. Otherwise, signals from the remote interface may make the test result inaccurate.

Example

Test the cable connected to Eth2/0/0.

```
<Huawei> system-view
[Huawei] interface ethernet 2/0/0
[Huawei-Ethernet2/0/0] virtual-cable-test
Warning: The command will stop service for a while, continue[Y/N]?y
Pair A length: 189meter(s)
Pair B length: 189meter(s)
Pair C length: 189meter(s)
Pair D length: 189meter(s)
Pair A state: Ok
Pair B state: Ok
Pair C state: Ok
Pair D state: Ok
```

Table 5-17 Description of the virtual-cable-test command output

Item	Description
Pair A/B/C/D	Four pairs of circuits in a network cable.
Pair A length	Length of a network cable: • The length is the distance between the interface and the fault point if a fault occurs. • The length is the actual length of the cable when the cable works properly. • The default length is 0 m if the interface is not connected to any network cable.
Pair A state	Network cable status: • Ok: indicates that the circuit pair is terminated normally. • Open: indicates that the circuit pair is not terminated. • Short: indicates that the circuit pair is short-circuited. • Crosstalk: indicates that the circuit pairs interfere with each other. • Unknown: indicates that the circuit pair has an unknown fault.

5.3 Serial Interface Configuration Commands

Copyright © Huawei Technologies Co., Ltd.

5.3.1 async mode (serial)

Function

The **async mode** command sets the working mode for an asynchronous serial interface.

The **undo async mode** command restores the default setting.

By default, an asynchronous serial interface works in protocol mode.

Format

async mode { **flow** | **protocol** }

undo async mode

Parameters

Parameter	Description	Value
flow	Configures an asynchronous serial interface to work in flow mode.	-
protocol	Configures an asynchronous serial interface to work in protocol mode.	-

Views

Serial interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

When two devices communicate by using asynchronous serial interfaces, the asynchronous serial interfaces work in protocol or flow mode. An asynchronous serial interface usually works in protocol mode. The flow mode is used for man-to-machine interactions such as dial-up.

- In protocol mode, serial interfaces on both ends establish a link based on the existing link layer protocol parameters after a physical connection is established between them.
- In flow mode, serial interfaces on both ends interact with each other, the local interface sends configuration information to the remote interface to set

 Copyright © Huawei Technologies Co., Ltd.

physical layer protocol parameters for the remote interface, and then the two interfaces establish a link based on the configured parameters.

Prerequisites

The serial interface has been configured to work in asynchronous mode by using the **physical-mode** command.

Precautions

- If you run the **async mode** command multiple times in the same serial interface view, only the latest configuration takes effect.
- After an asynchronous serial interface is configured to work in flow mode, the link layer protocol of this interface cannot be set to PPP.

Example

Configure an asynchronous serial interface to work in flow mode.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] physical-mode async
[Huawei-Serial1/0/0] async mode flow
```

Related Topics

5.3.20 physical-mode

5.3.21 phy-mru (serial)

5.3.2 baudrate

Function

The **baudrate** command sets the baud rate for a synchronous serial interface.

The **undo baudrate** command restores the default setting.

By default, the baud rate of a synchronous serial interface is 64000 bit/s.

Format

baudrate *baudrate*

undo baudrate

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
baudrate	Specifies the baud rate for a synchronous serial interface.	A synchronous serial interface supports the following baud rates, which are expressed in bit/s: • 1200 • 2400 • 4800 • 9600 • 19200 • 38400 • 56000 • 57600 • 64000 • 72000 • 115200 • 128000 • 192000 • 256000 • 384000 • 512000 • 768000 • 1024000 • 2048000 • 8192000

Views

Serial interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Synchronous serial interfaces on both ends of a cable are of different types. One synchronous serial interface is a Data Terminal Equipment (DTE) interface, and the other is a Data Circuit-terminating Equipment (DCE) interface. A DTE refers to

 Copyright © Huawei Technologies Co., Ltd.

the device on which serial interfaces are connected to DTE cables; a DCE refers to the device on which serial interfaces are connected to DCE cables.

The baud rate determines the line transmission rate. You can set the baud rate on a DCE based on the cable type.

Prerequisites

The serial interface has been configured to work in synchronous mode by using the **physical-mode** command.

Precautions

If you run the **baudrate** command multiple times in the same serial interface view, only the latest configuration takes effect.

The **baudrate** command can be used only when the device functions as a DCE.

The baud rate range varies depending on the cable type.

- V.24DCE: 1200 bit/s to 64000 bit/s
- For the V.35DCE, RS449DCE, and RS530DCE, the baud rate range is as follows:
  - 1SA/2SA interface card: 1200 bit/s to 2048000 bit/s
  - 8SA interface card: 1200 bit/s to 8192000 bit/s
  - Serial interface on the AR2202-48FE: 1200 bit/s to 8192000 bit/s

NOTE

Ensure that the configured baud rate is the same as virtual baud rate (configured by the **virtualbaudrate** command) on the remote end (DTE). Otherwise, some packets will be discarded.

Example

Set the baud rate of a synchronous serial interface to 72000 bit/s.

```
<Huawei> system-view
[Huawei] interface serial 2/0/0
[Huawei-Serial2/0/0] physical-mode sync
[Huawei-Serial2/0/0] baudrate 72000
```

Related Topics

5.3.20 physical-mode

5.3.23 virtualbaudrate

5.3.9 display interface serial

5.3.3 clock dce

Function

The **clock dce** command sets the clock mode for a synchronous serial interface on the DCE.

The **undo clock dce** command restores the default setting.

By default, the clock mode of a synchronous serial interface is **dceclk1** on the DCE.

Copyright © Huawei Technologies Co., Ltd.

Format

clock dce { **dceclk1** | **dceclk2** | **dceclk3** }

undo clock dce

Parameters

Parameter	Description	Setting
dceclk1	Sets the clock mode of a synchronous serial interface to **dceclk1** on the DCE.	-
dceclk2	Sets the clock mode of a synchronous serial interface to **dceclk2** on the DCE.	-
dceclk3	Sets the clock mode of a synchronous serial interface to **dceclk3** on the DCE. **NOTE** This parameter does not take effect for serial interfaces on 1SA/2SA interface cards.	-

Views

Serial interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Two communicating parties are connected through serial interfaces. One party functions as the DTE, and the other functions as the DCE. To exchange data successfully, communicating parties must work in clock synchronization state. For example, the DCE receive clock must be synchronized with the DTE transmit clock to ensure that the DCE can correctly receive data from the DTE.

Figure 5-1 shows the connections of clocks on synchronous serial interfaces. RD indicates a pin for receiving data. TD indicates a pin for sending data. RC, TC, and ETC indicate pins for sending or receiving clock signals.

 Copyright © Huawei Technologies Co., Ltd.

Figure 5-1 Connections of clocks on synchronous serial interfaces

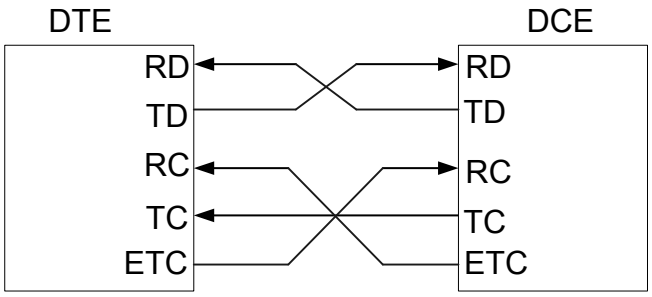


Table 5-18 describes the clock modes of a device functioning as a DCE. **TxClk** indicates the DCE send clock, and **RxClk** indicates the DCE receive clock. **RC** and **TC** indicate external clocks, and **Local** indicates a local clock.

Table 5-18 DCE clock modes

Clock Mode	Description	Precautions
dceclk1	TxClk = Local, RxClk = RC	• The DTE must use an RC clock as a receive clock. Otherwise, the DTE may receive error packets. • The DTE send clock must be synchronized with the ETC clock. Otherwise, the DCE may receive error packets.
dceclk2	TxClk = Local, RxClk = Local	The DTE must use RC clocks as its send and receive clocks. Otherwise, data transmission is abnormal.

Copyright © Huawei Technologies Co., Ltd.

Clock Mode	Description	Precautions
dceclk3	TxClk = RC, RxClk = RC	• The DTE send clock must be synchronized with the ETC clock. Otherwise, the DCE may receive error packets. • The DTE receive clock must be synchronized with the ETC clock. Otherwise, the DTE may receive error packets.

Prerequisites

The serial interface has been configured to work in synchronous mode using the **physical-mode sync** command.

Precautions

If you run the **clock dce** command multiple times in the same serial interface view, only the latest configuration takes effect.

The **clock dce** command can be used only when the device functions as a DCE.

Example

Set the clock mode of Serial1/0/0 to **dceclk2** on the DCE.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] clock dce dceclk2
```

Related Topics

5.3.20 physical-mode

5.3.4 clock dte

Function

The **clock dte** command sets the clock mode for a synchronous serial interface on the DTE.

The **undo clock dte** command restores the default setting.

By default, the clock mode of a synchronous serial interface is **dteclk1** on the DTE.

Format

clock dte { **dteclk1** | **dteclk2** | **dteclk3** }

undo clock dte

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Setting
dteclk1	Sets the clock mode of a synchronous serial interface to **dteclk1** on the DTE. **NOTE** When the DTE uses an X.21 cable to connect to the DCE, the **dteclk2** mode is used even if you specify parameter **dteclk1** in the command.	-
dteclk2	Sets the clock mode of a synchronous serial interface to **dteclk2** on the DTE. **NOTE** When the DTE uses a V.24 cable to connect to the DCE, the DTE does not support parameter **dteclk2**.	-
dteclk3	Sets the clock mode of a synchronous serial interface to **dteclk3** on the DTE.	-

Views

Serial interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Two communicating parties are connected through serial interfaces. One party functions as the DTE, and the other functions as the DCE. To exchange data successfully, communicating parties must work in clock synchronization state. For example, the DCE receive clock must be synchronized with the DTE transmit clock to ensure that the DCE can correctly receive data from the DTE.

Figure 5-2 shows the connections of clocks on synchronous serial interfaces. RD indicates a pin for receiving data. TD indicates a pin for sending data. RC, TC, and ETC indicate pins for sending or receiving clock signals.

 Copyright © Huawei Technologies Co., Ltd.

Figure 5-2 Connections of clocks on synchronous serial interfaces

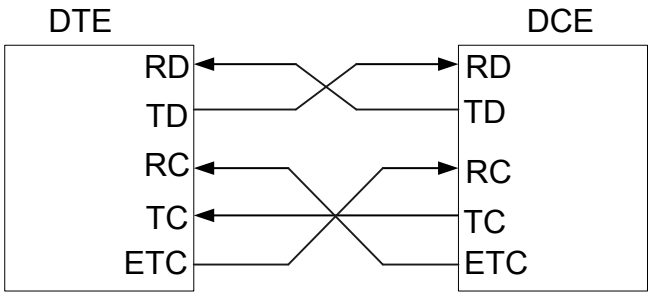


Table 5-19 describes the clock modes of a device functioning as a DTE. **TxClk** indicates the DTE send clock, and **RxClk** indicates the DTE receive clock. **RC** and **TC** indicate external clocks, and **Local** indicates a local clock.

Table 5-19 DTE clock modes

Clock Mode	Description	Precautions
dteclk1	TxClk = TC, RxClk = RC	The DTE uses clocks provided by the DCE. • The DCE send clock must be synchronized with the ETC clock. Otherwise, the DTE may receive error packets. • The DCE receive clock must be synchronized with the TC clock. Otherwise, the DCE may receive error packets.

Copyright © Huawei Technologies Co., Ltd.

Clock Mode	Description	Precautions
dteclk2	TxClk = RC, RxClk = RC	The DTE uses clocks provided by the DCE. • The DCE send clock must be synchronized with the ETC clock. Otherwise, the DTE may receive error packets. • The DCE receive clock must be synchronized with the ETC clock. Otherwise, the DCE may receive error packets.
dteclk3	TxClk = Local, RxClk = RC	• The DCE send clock must be synchronized with the ETC clock. Otherwise, the DTE may receive error packets. • The DCE must use an RC clock as a receive clock. Otherwise, the DCE may receive error packets.

Prerequisites

The serial interface has been configured to work in synchronous mode using the **physical-mode sync** command.

Precautions

If you run the **clock dte** command multiple times in the same serial interface view, only the latest configuration takes effect.

The **clock dte** command can be used only when the device functions as a DTE.

Example

Set the clock mode of Serial1/0/0 to **dteclk2** on the DTE.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] clock dte dteclk2
```

Related Topics

5.3.20 physical-mode

Copyright © Huawei Technologies Co., Ltd.

5.3.5 code (serial)

Function

The **code** command sets the encoding and decoding mode for a synchronous serial interface.

The **undo code** command restores the default setting.

The default encoding and decoding mode of a synchronous serial interface is Non Return to Zero (NRZ).

Format

code { **nrz** | **nrzi** }

undo code

Parameters

Parameter	Description	Value
nrz	Sets the encoding and decoding mode to NRZ.	-
nrzi	Sets the encoding and decoding mode to Non Return to Zero Inverted (NRZI).	-

Views

Serial interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

NRZ and NRZI are encoding and decoding modes for synchronous serial interfaces.

- In NRZ, the positive level and negative level represent different logic values (1 or 0). The NRZ signal does not have a transition if the bit being transmitted is a logic 0.
- In NRZI, level inversion represents a logic value (1 or 0), and an unchanged level represents the other logic value (1 or 0). The NRZI signal does not have a transition if the bit being transmitted is a logic 0.

The default encoding and decoding mode of a synchronous serial interface is NRZ. When the encoding and decoding mode of the remote synchronous serial

 Copyright © Huawei Technologies Co., Ltd.

interface is NRZI, the encoding and decoding mode of the local synchronous serial interface needs to be changed to NRZI.

Prerequisites

The serial interface has been configured to work in synchronous mode by using the **physical-mode** command.

Precautions

If you run the **code** command multiple times in the same serial interface view, only the latest configuration takes effect.

If two devices communicate by using synchronous serial interfaces, the two devices must have the same encoding and decoding mode. Otherwise, received data frames will be decoded incorrectly and discarded as error frames.

Example

Set the encoding and decoding mode of a synchronous serial interface to NRZI.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] code nrzi
```

Related Topics

5.3.20 physical-mode

5.3.6 crc (serial)

Function

The **crc** command configures the cyclic redundancy check (CRC) mode of a synchronous serial interface.

The **undo crc** command restores the default CRC mode of a synchronous serial interface.

By default, the 16-bit CRC is used.

Format

crc { **16** | **32** | **none** }

undo crc

Parameters

Parameter	Description	Value
16	Indicates the 16-bit CRC.	-
32	Indicates the 32-bit CRC.	-

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
none	Indicates that the synchronous serial interface does not perform CRC.	-

Views

Serial interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

CRC is a commonly used method to detect transmission errors in a communication system. It checks for transmission errors by adding redundancy codes to the original data. Transmission errors are more likely to be detected when more redundancy codes are added, but data is transmitted at a lower efficiency. Use the 16-bit or 32-bit CRC mode as required.

Prerequisites

The serial interface has been configured to work in synchronous mode by using the **physical-mode** command.

Configuration Impact

If you run the **crc** command multiple times in the same serial interface view, only the latest configuration takes effect.

Example

Set the CRC mode to 32-bit CRC on Serial 1/0/0.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-serial1/0/0] ] physical-mode sync
[Huawei-Serial1/0/0] crc 32
```

5.3.7 detect dcd

Function

The **detect dcd** command enables Data Carrier Detect (DCD) signal detection on a synchronous serial interface.

The **undo detect dcd** command disables Data Carrier Detect (DCD) signal detection on a synchronous serial interface.

By default, DCD signal detection is enabled on a synchronous serial interface.

Copyright © Huawei Technologies Co., Ltd.

Format

detect dcd

undo detect dcd

Parameters

None

Views

Serial interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

DCD signals monitor the working status of lines and DCEs. The **detect dcd** command enables DCD signal detection on a synchronous serial interface. DCD signal detection is used together with detection of Data Set Ready (DSR) and Data Terminal Ready (DTR) signals to determine the status of the synchronous serial interface.

The status of a synchronous serial interface is determined based on the following items:

- If detection of DSR and DTR signals is enabled on the interface, the device determines the status (Up or Down) of the interface by detecting DSR and DTR signals and checking whether the interface is connected to an external cable. The device considers the interface Up only when DSR and DCD signals are valid and the interface is connected to an external cable.
- If detection of DSR and DTR signals is disabled on the interface, the device considers that the interface is in Up state as long as it detects that the interface is connected to an external cable.

Prerequisites

The serial interface has been configured to work in synchronous mode by using the **physical-mode** command.

Example

Enable DCD signal detection on a synchronous serial interface.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] detect dcd
```

Related Topics

5.3.20 physical-mode

 Copyright © Huawei Technologies Co., Ltd.

5.3.9 display interface serial
5.3.8 detect dsr-dtr (serial)

5.3.8 detect dsr-dtr (serial)

Function

The **detect dsr-dtr** command enables detection of DSR and DTR signals on a serial interface.

The **undo detect dsr-dtr** command disables detection of DSR and DTR signals on a serial interface.

By default, detection of DSR and DTR signals is enabled on a serial interface.

Format

detect dsr-dtr

undo detect dsr-dtr

Parameters

None

Views

Serial interface view

Default Level

2: Configuration level

Usage Guidelines

A DCE sends DSR signals to tell a DTE whether it is working, and a DTE sends DTR signals to tell a DCE whether it is working. The **detect dsr-dtr** command enables DSR and DTR signal detection on a serial interface, helping to determine the status of the serial interface.

The status of an asynchronous serial interface is determined based on the following items:

- If detection of DSR and DTR signals is enabled on the interface, the device considers the interface Up only when valid DSR signals are detected and the interface is connected to an external cable.
- If detection of DSR and DTR signals is disabled on the interface, the device automatically notifies users that the interface is in Up state without detecting whether the interface is connected to an external cable.

Example

Enable detection of DSR and DTR signals on a serial interface.

 Copyright © Huawei Technologies Co., Ltd.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] detect dsr-dtr
```

Related Topics

5.3.20 physical-mode

5.3.9 display interface serial

5.3.7 detect dcd

5.3.9 display interface serial

Function

The **display interface serial** command displays the running status of and statistics about a serial interface.

Format

display interface serial [*interface-number*]

Parameters

Parameter	Description	Value
interface-number	Specifies the number of a serial interface. If no interface number is specified, the running status of and statistics about all serial interfaces are displayed.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

When monitoring the serial interface status or locating faults on a serial interface, you can run the **display interface serial** command to view the running status of and statistics about the serial interface. You can collect traffic statistics and locate faults on the serial interface according to the command output.

Example

Display the status of Serial1/0/0.

Copyright © Huawei Technologies Co., Ltd.

```
<Huawei> display interface serial 1/0/0
Serial1/0/0 current state : UP
Line protocol current state : UP
Last line protocol up time : 2011-02-25 16:00:49
Description:HUAWEI, AR Series, Serial1/0/0 Interface
Route Port,The Maximum Transmit Unit is 1500, Hold timer is 10(sec)
Internet Address is 1.1.1.1/24
Link layer protocol is nonstandard HDLC
Last physical up time   : 2011-02-25 16:00:50
Last physical down time : 2011-02-25 16:00:49
Current system time: 2011-02-25 16:40:01
Last 300 seconds input rate 5210 bytes/sec 41680 bits/sec 100 packets/sec
Last 300 seconds output rate 5009 bytes/sec 40072 bits/sec 100 packets/sec
Input: 0 packets, 0 bytes
  Broadcast:              0,  Multicast:              0
  Errors:                 0,  Runts:                  0
  Giants:                 0,  CRC:                    0

  Alignments:             0,  Overruns:               0
  Dribbles:               0,  Aborts:                 0
  No Buffers:             0,  Frame Error:            0

Output: 0 packets, 0 bytes
  Total Error:            0,  Overruns:               0
  Collisions:             0,  Deferred:               0
  No Buffers:             0
    Input bandwidth utilization  : 0%
    Output bandwidth utilization : 0%
```

Table 5-20 Description of the display interface serial command output

Item	Description
Serial1/0/0 current state	Current physical status of the serial interface: • UP: indicates that the interface is physically Up. • DOWN: indicates that the interface is physically Down. • Administratively down: indicates that the administrator has run the **shutdown** command on the interface.
Line protocol current state	Link layer protocol status of the interface: • UP: indicates that the link layer protocol status of the interface is Up. • DOWN: indicates that the link layer protocol status of the interface is Down or no IP address is assigned to the interface. **damping** indicates that the interface is suppressed because of frequent flapping.
Last line protocol up time	Last time the link layer protocol of the interface goes Up.
Description	Description of the interface.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
The Maximum Transmit Unit is	Maximum Transmission Unit (MTU) of the interface. The default MTU on a serial interface is 1500 bytes. Packets whose size is greater than the MTU are fragmented before being transmitted. If non-fragmentation is enabled, the packets are discarded. To set the MTU, run the **mtu** command.
Internet Address is	IP address and subnet mask of the interface.
Last physical up time	Last time the link layer protocol of the interface goes Up.
Last physical down time	Last time the link layer protocol of the interface goes Down.
Hold timer	Lifecycle of a packet. If a packet is not sent out before the hold timer times out, the packet is discarded.
Internet Address	IP address of the interface. If no IP address is assigned to the interface, the system displays "Internet protocol processing: disabled."
Link layer protocol	Link layer protocol of the serial interface.
Current system time	Current system time. If the time zone is configured and the daylight saving time is used, the time is in YYYY-MM-DD HH:MM:SS UTC±HH:MM DST format.
Interface is	Cable type of the serial interface.
Broadcast	Number of broadcast packets received or sent by the interface.
Multicast	Number of multicast packets received or sent by the interface.
Errors	Number of error packets detected at the physical layer.
Runts	Number of undersized frames with the correct FCS received by the interface.
Giants	Number of received jumbo frames with the correct FCS.
CRC	Number of CRC error packets received by the interface.
Alignments	Number of received packets with alignment errors.
Overruns	Number of received packets above the upper limit of the FIFO queue.
Aborts	Number of received packets aborted unexpectedly.
No Buffers	Number of received packets that cannot be buffered.
Frame Error	Number of received packets with frame errors.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Overruns	Number of sent packets below the upper limit of the FIFO queue.
Collisions	Number of sent packets with 1 to 15 conflict events.
Deferred	Number of delayed packets without conflict.
Input	Total number of received packets.
Output	Total number of sent packets.
Input bandwidth utilization	Inbound bandwidth usage.
Output bandwidth utilization	Outbound bandwidth usage.

Related Topics

5.3.19 mtu (serial)

5.3.10 display tdm statistic

Function

The **display tdm statistic** command displays service statistics of a TDM interface.

Format

display tdm statistic interface *interface-type interface-number*

Parameters

Parameter	Description	Value
interface *interface-type interface-number*	Specifies the number of a TDM interface.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

Usage Scenario

Copyright © Huawei Technologies Co., Ltd.

After configuring the TDM service, you can run this command to view service statistics of a TDM interface.

Precautions

- The service statistics of a TDM interface can be displayed only after the TDM service is configured.
- TDM interfaces include the synchronous/asynchronous serial interfaces that work in synchronous mode on the 8SA interface card, the interfaces formed by CE1/PRI or CT1/PRI interfaces (excluding ISDN PRI interfaces) on the 8E1T1-M interface card, and the interfaces formed by E1-F or T1-F interfaces on the 8E1T1-F interface card.

Example

Display service statistics of a TDM interface.

```
<Huawei> display tdm statistic interface serial 2/0/0
Serial2/0/0
  TxPkts  = 370066
  RxPkts  = 370858
  LosPkts  = 1064
  Overrun Count   = 308
  Underrun Count  = 83342
  MisOrderPkts    = 428
  MalformedPkts   = 328
```

Table 5-21 Description of the display tdm statistic command output

Item	Description
Serial2/0/0:0	TDM interface to be queried.
TxPkts	Number of packets that are sent.
RxPkts	Number of packets that are received.
LosPkts	Number of packets that are discarded.
Overrun Count	Number of packets that exceed the buffer upper limit.
Underrun Count	Number of packets that exceed the buffer lower limit.
MisOrderPkts	Number of packets not in sequence.
MalformedPkts	Number of malformed packets.

Related Topics

5.3.17 link-protocol tdm

5.3.11 idlecode (serial)

Function

The **idlecode** command sets the line idle code for a synchronous serial interface.

Copyright © Huawei Technologies Co., Ltd.

The **undo idlecode** command restores the default setting.

By default, a synchronous serial interface uses the line idle code 0x7e.

Format

idlecode { **7e** | **ff** }

undo idlecode

Parameters

Parameter	Description	Value
7e	Sets the line idle code to 0x7e for a synchronous serial interface.	-
ff	Sets the line idle code to 0xff for a synchronous serial interface.	-

Views

Serial interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

A synchronous serial interface transmits electrical signals, and therefore the interface line keeps transmitting data. When the interface line is idle, the line idle code is used to indicate that the line is idle.

NOTE

A synchronous serial interface supports two line idle codes: 0x7e and 0xff. The default line idle code 0x7e is recommended.

Prerequisites

The serial interface has been configured to work in synchronous mode by using the **physical-mode** command.

Precautions

If you run the **idlecode** command multiple times in the same serial interface view, only the latest configuration takes effect.

Two devices can communicate properly only when the same line idle code is set for serial interfaces on both devices.

 Copyright © Huawei Technologies Co., Ltd.

Example

Set the line idle code to 0xff for a synchronous serial interface.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] idlecode ff
```

Related Topics

5.3.20 physical-mode

5.3.12 interface serial

Function

The **interface serial** command displays the serial interface view.

Format

interface serial *interface-number*

Parameters

Parameter	Description	Value
interface-number	Specifies the number of a serial interface.	-

Views

System view

Default Level

2: Configuration level

Usage Guidelines

To set attributes for a serial interface, run the **interface serial** command to enter the serial interface view.

Example

Enter the view of Serial1/0/0.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0]
```

Related Topics

5.3.9 display interface serial

Copyright © Huawei Technologies Co., Ltd.

5.3.13 invert receive-clock

Function

The **invert receive-clock** command configures the device to invert clock signals received by a synchronous serial interface.

The **undo invert receive-clock** command restores the default setting.

By default, clock signals received by a synchronous serial interface are not inverted.

Format

invert receive-clock

undo invert receive-clock

Parameters

None

Views

Serial interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

In some special scenarios, clock delay occurs on a link. Then clocks on two ends are not synchronized or a large number of packets are discarded. To resolve this problem, configure the serial interface to invert clock signals that the serial interface sends and receives.

The procedure for determining clock signal inverting is as follows:

- By default, clock signals received by a synchronous serial interface are not inverted. If the protocol status of the synchronous serial interface can be Up, you do not need to modify the configuration of the synchronous serial interface. If the protocol status of the synchronous serial interface cannot be Up, check the packet statistics on the synchronous serial interface.
  - If the DTE receives error packets, for example, the packet count is not a multiple of the byte count, run the **invert receive-clock** command to configure the device to invert clock signals received by the synchronous serial interface.
  - If the DTE does not receive error packets but the DCE receives error packets, run the **invert transmit-clock** command to configure the device to invert clock signals transmitted by the synchronous serial interface.

 Copyright © Huawei Technologies Co., Ltd.

- If error packets are still increasing after the **invert receive-clock** and **invert transmit-clock** commands are executed, contact Huawei technical support personnel.

Prerequisites

The serial interface has been configured to work in synchronous mode by using the **physical-mode** command.

Precautions

NOTE

You can configure the device to invert clock signals received by a synchronous serial interface as required.

Example

Configure the device to invert clock signals received by a synchronous serial interface.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] invert receive-clock
```

Related Topics

5.3.20 physical-mode

5.3.15 invert transmit-clock

5.3.14 invert receive-clock auto

Function

The **invert receive-clock auto** command configures the device to automatically invert clock signals received by a synchronous serial interface.

The **undo invert receive-clock auto** command restores the default setting.

By default, clock signals received by a synchronous serial interface are not inverted.

Format

invert receive-clock auto

undo invert receive-clock auto

Parameters

None

Views

Serial interface view

 Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

When line signals are frequently interfered, clock delays may occur on the line from time to time. The device having the **invert receive-clock** command configured inverts clock signals received by a serial interface only once and does not invert clock signals for subsequent delays. In addition, when the delay disappears, the received clock signals are not automatically inverted back. As a result, clock signals are still not synchronized on the two interworking parties.

To resolve the problem, you can run the **invert receive-clock auto** command on the serial interface to configure the device to automatically invert clock signals. In this way, the received clock signals are automatically inverted upon clock delays on the line. When the delays disappear, the received clock signals are automatically inverted back, preventing impact of the delays and ensuring that clock signals are synchronized on the two interworking parties.

Prerequisites

The serial interface has been configured to work in synchronous mode using the **physical-mode sync** command.

Precautions

- The **invert receive-clock auto** command takes effect only on serial interfaces of the 1SA and 2SA interface cards.
- The **invert receive-clock auto** and **invert receive-clock** command cannot be configured simultaneously on the same interface.

Example

Configure the device to automatically invert clock signals received by the synchronous Serial1/0/0 interface.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] invert receive-clock auto
```

Related Topics

5.3.13 invert receive-clock

5.3.15 invert transmit-clock

Function

The **invert transmit-clock** command configures the device to invert clock signals transmitted by a synchronous serial interface.

The **undo invert transmit-clock** command restores the default setting.

 Copyright © Huawei Technologies Co., Ltd.

By default, clock signals transmitted by a synchronous serial interface are not inverted.

Format

invert transmit-clock

undo invert transmit-clock

Parameters

None

Views

Serial interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

In some special scenarios, clock delay occurs on a link. Then clocks on two ends are not synchronized or a large number of packets are discarded. To resolve this problem, configure the serial interface to invert clock signals that the serial interface sends and receives.

The procedure for determining clock signal inverting is as follows:

- By default, clock signals received by a synchronous serial interface are not inverted. If the protocol status of the synchronous serial interface can be Up, you do not need to modify the configuration of the synchronous serial interface. If the protocol status of the synchronous serial interface cannot be Up, check the packet statistics on the synchronous serial interface.
  - If the DTE receives error packets, for example, the packet count is not a multiple of the byte count, run the **invert receive-clock** command to configure the device to invert clock signals received by the synchronous serial interface.
  - If the DTE does not receive error packets but the DCE receives error packets, run the **invert transmit-clock** command to configure the device to invert clock signals transmitted by the synchronous serial interface.
- If error packets are still increasing after the **invert receive-clock** and **invert transmit-clock** commands are executed, contact Huawei technical support personnel.

Prerequisites

The serial interface has been configured to work in synchronous mode by using the **physical-mode** command.

Precautions

 Copyright © Huawei Technologies Co., Ltd.

NOTE

You can configure the device to invert clock signals transmitted by a synchronous serial interface as required.

Example

Configure the device to invert clock signals transmitted by a synchronous serial interface.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] invert transmit-clock
```

Related Topics

5.3.20 physical-mode

5.3.13 invert receive-clock

5.3.16 itf number (serial interface view)

Function

The **itf number** command sets the number of interframe filling tags of a synchronous serial interface.

The **undo itf number** command restores the default setting.

By default, the number of interframe filling tags of a synchronous serial interface is 4.

Format

itf number *number*

undo itf number

Parameters

Parameter	Description	Value
number	Specifies the number of interframe filling tags.	The value is an integer that ranges from 0 to 14. Each interframe filling tag occupies one byte.

Views

Serial interface view

Default Level

2: Configuration level

Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

Usage Scenario

An interframe filling tag is a code sent when an interface does not send any service data, and allows the receiver to have a period of time for processing the received data frame and getting ready to receive the next frame.

Interframe filling tags generate extra costs and affect the transmission rate of the interface. You can use the **itf number** command to manually set a proper number of interframe filling tags between two neighboring frames, ensuring a proper transmission rate.

- When you increase the number of interframe filling tags, the rate of sending valid data packets decreases.
- When you decrease the number of interframe filling tags, the rate of sending valid data packets increases.

  NOTE

  Since interframe filling tags bring extra costs, the transmission rate of a serial interface usually does not reach the bandwidth requirement. To increase the transmission rate of the serial interface, set a small number of interframe filling tags using the **itf number** command.

Prerequisites

The serial interface has been configured to work in synchronous mode using the **physical-mode sync** command.

Precautions

- Interfaces on both ends can communicate only when the same number of interframe filling tags is set for them.
- The number of interframe filling tags cannot be set to 2 on the 1SA and 2SA interface cards.
- Serial interfaces formed by E1/T1 interfaces do not support the **itf number** command.

Example

Set the number of interframe filling tags to 1 on Serial1/0/0.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] itf number 1
```

5.3.17 link-protocol tdm

Function

The **link-protocol tdm** command sets the encapsulation protocol to TDM for a serial interface.

The **undo link-protocol tdm** command restores the default setting.

By default, PPP is used as the encapsulation protocol on a serial interface.

Copyright © Huawei Technologies Co., Ltd.

NOTE

The serial interface formed by the 6E&M card supports only TDM as the encapsulation protocol.

Format

link-protocol tdm

undo link-protocol tdm

Parameters

None

Views

Serial interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

To enable a serial interface to send and receive TDM data, run the **link-protocol tdm** command to set the encapsulation protocol to TDM for the serial interface.

NOTE

- When changing the encapsulation protocol to TDM, you can directly enable TDM without disabling the original encapsulation protocol.
- After the encapsulation protocol is set to TDM, the interface does not support subinterface creation.

Precautions

- The configuration of the **link-protocol tdm** command overrides the configurations of previous link-layer protocols, interrupts services of the protocols, and releases resources occupied by the protocols.
- The following serial interfaces support this command: synchronous/asynchronous serial interfaces on the 8SA interface card, interfaces formed by CE1/PRI, CT1/PRI interfaces (excluding ISDN PRI interfaces) on the 8E1T1-M interface card, interfaces formed by E1-F or T1-F interfaces on the 8E1T1-F interface card and E&M interfaces.

  NOTE

  The encapsulation protocol can be set to TDM on the 8SA, 8E1T1-M, and 8E1T1-F interface cards of the device only when the device MPU can deliver the 8KHZ clock to the 8SA, 8E1T1-M, and 8E1T1-F interface cards. The MPU can be: SRU40, SRU60, SRU80, or SRU100.

  The encapsulation protocol can be set to TDM only on the VB interface cards among 8E1T1-M and 8E1T1-F interface cards. You can run the **display version slot** *slot-id* command in the diagnosis view to check the version number of the 8E1T1-M or 8E1T1-F interface card on the specified slot. If the **PCB** field value is **VER.B**, the 8E1T1-M or 8E1T1-F interface card is the VB interface card.

 Copyright © Huawei Technologies Co., Ltd.

Example

Set the encapsulation protocol to TDM on Serial2/0/0.

```
<Huawei> system-view
[Huawei] interface serial 2/0/0
[Huawei-Serial2/0/0] link-protocol tdm
```

5.3.18 loopback

Function

Using the **loopback** command, you can enable loopback detection and set the loopback detection mode on a serial interface.

Using the **undo loopback** command, you can restore the default setting.

By default, internal loopback detection is disabled.

Format

loopback { **local** | **remote** }

undo loopback

Parameters

Parameter	Description	Value
local	Sets internal loopback.	-
remote	Sets external loopback.	-

Views

Serial interface view, async interface view

Default Level

2: Configuration level

Usage Guidelines

The loopback detection function detects the interface status or cable status and must be disabled when devices work properly.

- In internal loopback mode, the local device loops back outgoing packets to itself to test whether it works properly.
- In external loopback mode, the local device loops back the packets received from its peer device to the peer device to test whether the link between the two devices works properly.

 Copyright © Huawei Technologies Co., Ltd.

Example

Enable internal loopback detection on Serial 1/0/0.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] loopback local
```

5.3.19 mtu (serial)

Function

The **mtu** command sets the MTU for a serial interface.

The **undo mtu** command restores the default MTU.

By default, the MTU of a serial interface is 1500 bytes.

Format

mtu *mtu*

undo mtu

Parameters

Parameter	Description	Value
mtu	Specifies the MTU of a serial interface.	The value is an integer and the value depends on the device.

Views

Serial interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The size of data frames is limited at the network layer. Any time the IP layer receives an IP packet, it checks to which local interface the packet needs to be sent and obtains the MTU configured on the interface. Then the IP layer compares the MTU with the packet length. If the packet length is longer than the MTU, the IP layer fragments the packet into smaller packets, which are shorter than the MTU.

If forcible unfragmentation is configured, some packets may be discarded during data transmission at the IP layer. Therefore, large packets must be forcibly

 Copyright © Huawei Technologies Co., Ltd.

fragmented to prevent packet loss on the network. In this case, you can run the **mtu** command to set the size of a fragment.

Configuration Impact

If you run the **mtu** command multiple times in the same serial interface view, only the latest configuration takes effect.

Follow-up Procedure

Run the **shutdown** and **undo shutdown**/**restart** commands to restart the related physical interface to make the configuration take effect.

Example

Set the MTU of a serial interface to 1200 bytes.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] mtu 1200
[Huawei-Serial1/0/0] restart
```

Related Topics

5.3.9 display interface serial

5.3.20 physical-mode

Function

The **physical-mode** command sets the working mode for a serial interface.

By default, a serial interface works in synchronous mode.

Format

physical-mode { **async** | **sync** }

Parameters

Parameter	Description	Value
async	Configures a serial interface to work in asynchronous mode.	-
sync	Configures a serial interface to work in synchronous mode.	-

Views

Serial interface view

Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

A serial interface works in synchronous or asynchronous mode. When a serial interface is used to establish a Digital Data Network (DDN) leased line or connects to a terminal, the serial interface works in synchronous mode. When a serial interface is used to establish an asynchronous leased line or is used for modem dial-up, data backup, or terminal access, the serial interface works in asynchronous mode.

Precautions

If you run the **physical-mode** command multiple times in the same serial interface view, only the latest configuration takes effect.

Serial interfaces on both ends must work in the same mode.

Synchronous serial interfaces on both ends of a cable are of different types. One synchronous serial interface is a Data Terminal Equipment (DTE) interface, and the other is a Data Circuit-terminating Equipment (DCE) interface. The device where a DTE interface is located is a DTE, and the device where a DCE interface is located is a DCE. The device functions as a DTE or DCE.

The serial interface on the main control board of AR2202-48FE can work only in synchronous mode. Therefore, the AR2202 does not support this command.

When changing the working mode of a serial interface, run the **reset counters interface serial** *interface-number* command to clear the statistics on the interface to ensure the statistics accuracy.

Example

Configure a serial interface to work in asynchronous mode.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] physical-mode async
```

Related Topics

5.3.9 display interface serial

5.3.21 phy-mru (serial)

Function

The **phy-mru** command sets the maximum receive unit (MRU) for an asynchronous serial interface.

The **undo phy-mru** command restores the default MRU.

By default, the MRU of an asynchronous serial interface is 1700 bytes.

Copyright © Huawei Technologies Co., Ltd.

Format

phy-mru *mrusize*

undo phy-mru

Parameters

Parameter	Description	Value
mrusize	Specifies the MRU for an asynchronous serial interface.	The value is an integer that ranges from 4 to 1700, in bytes.

Views

Serial interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The MRU is the maximum size of a packet that can be received by an interface. The MTU of a serial interface cannot be greater than the MRU of the interface, ensuring that both ends are capable of receiving packets from each other.

Prerequisites

The serial interface has been configured to work in asynchronous mode by using the **physical-mode** command.

Configuration Impact

If you run the **phy-mru** command multiple times in the same serial interface view, only the latest configuration takes effect.

Example

Set the MRU to 1200 bytes for an asynchronous serial interface.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] phy-mru 1200
```

Related Topics

5.3.20 physical-mode

5.3.1 async mode (serial)

Copyright © Huawei Technologies Co., Ltd.

5.3.22 reverse-rts

Function

The **reverse-rts** command configures the device to invert Request To Send (RTS) signals of a synchronous serial interface.

The **undo reverse-rts** command restores the default setting.

By default, RTS signals of a synchronous serial interface are not inverted.

Format

reverse-rts

undo reverse-rts

Parameters

None

Views

Serial interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

A synchronous serial interface works in full duplex mode by default. To make the device compatible with devices working in half duplex mode, run the **reverse-rts** command to configure the device to invert RTS signals of a synchronous serial interface so that RTS signals become invalid. Then the remote interface does not send data when the local interface is sending data.

Prerequisites

The serial interface has been configured to work in synchronous mode by using the **physical-mode** command.

Example

Configure the device to invert RTS signals of a synchronous serial interface.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] reverse-rts
```

Related Topics

5.3.20 physical-mode

5.3.9 display interface serial

Copyright © Huawei Technologies Co., Ltd.

5.3.23 virtualbaudrate

Function

The **virtualbaudrate** command sets the virtual baud rate for a synchronous serial interface.

The **undo virtualbaudrate** command restores the default setting.

The default virtual baud rate of a synchronous serial interface is 64000 bit/s.

Format

virtualbaudrate *virtualbaudrate*

undo virtualbaudrate

Parameters

Parameter	Description	Value
virtualbaudrate	Specifies the virtual baud rate for a synchronous serial interface.	A synchronous serial interface supports the following baud rates, which are expressed in bit/s: • 1200 • 2400 • 4800 • 9600 • 19200 • 38400 • 56000 • 57600 • 64000 • 72000 • 115200 • 128000 • 192000 • 256000 • 384000 • 512000 • 768000 • 1024000 • 2048000 • 8192000

Copyright © Huawei Technologies Co., Ltd.

Views

Serial interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The **virtualbaudrate** command sets the baud rate for a serial interface of a DTE.

Prerequisites

The serial interface has been configured to work in synchronous mode by using the **physical-mode** command.

Precautions

If you run the **virtualbaudrate** command multiple times in the same serial interface view, only the latest configuration takes effect.

The **virtualbaudrate** command can be used only on a DTE.

The virtual baud rate range varies depending on the cable type.

- V.24DTE: 1200 bit/s to 64000 bit/s
- For the V.35DTE, X.21DTE, RS449DTE, and RS530DTE, the virtual baud rate range is as follows:
  - 1SA/2SA interface card: 1200 bit/s to 2048000 bit/s
  - 8SA interface card: 1200 bit/s to 8192000 bit/s
  - Serial interface on the AR2202-48FE: 1200 bit/s to 8192000 bit/s

NOTE

Ensure that the configured virtual baud rate is the same as baud rate (configured by the **baudrate** command) on the remote end (DCE). Otherwise, some packets will be discarded.

Example

Set the virtual baud rate of a synchronous serial interface to 72000 bit/s.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] physical-mode sync
[Huawei-Serial1/0/0] virtualbaudrate 72000
```

Related Topics

5.3.20 physical-mode

5.3.2 baudrate

5.3.9 display interface serial

 Copyright © Huawei Technologies Co., Ltd.

5.4 Async Interface Configuration Commands

5.4.1 async mode (async)

Function

The **async mode** command sets the working mode for an async interface.

The **undo async mode** command restores the default setting.

By default, an async interface works in protocol mode.

Format

async mode { **flow** | **protocol** }

undo async mode

Parameters

Parameter	Description	Value
flow	Configures an async interface to work in flow mode.	-
protocol	Configures an async interface to work in protocol mode.	-

Views

Async interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

When two devices communicate by using async interfaces, the async interfaces work in protocol or flow mode. An async interface usually works in protocol mode. The flow mode is used for man-to-machine interactions such as dial-up.

- In protocol mode, async interfaces on both ends establish a link based on the existing link layer protocol parameters after a physical connection is established between them.

Copyright © Huawei Technologies Co., Ltd.

- In flow mode, async interfaces on both ends interact with each other, the local interface sends configuration information to the remote interface to set physical layer protocol parameters for the remote interface, and then the two interfaces establish a link based on the configured parameters.

Precautions

If you run the **async mode** command multiple times in the same async interface view, only the latest configuration takes effect.

After an async interface is configured to work in flow mode, the link layer protocol of this interface cannot be set to PPP, and mirroring and packet capturing cannot be configured on this interface.

After run the **async mode flow** command to set the working mode of the Async interface to flow mode, the physical layer status of the Async interface is Up by default.

Example

Configure an async interface to work in flow mode.

```
<Huawei> system-view
[Huawei] interface async 2/0/0
[Huawei-Async2/0/0] async mode flow
```

Related Topics

5.4.6 phy-mru (async)

5.4.2 detect dsr-dtr (async)

Function

The **detect dsr-dtr** command enables detection of DSR and DTR signals on an async interface.

The **undo detect dsr-dtr** command disables detection of DSR and DTR signals on an async interface.

By default, detection of DSR and DTR signals is enabled on an async interface.

Format

detect dsr-dtr

undo detect dsr-dtr

Parameters

None

Views

Async interface view

 Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

The **detect dsr-dtr** command enables DSR and DTR signal detection on an async interface, helping to determine the status of the async interface.

The status of an async interface is determined based on the following items:

- If detection of DSR and DTR signals is enabled on the interface, the device considers the interface Up only when valid DSR signals are detected and the interface is connected to an external cable.
- If detection of DSR and DTR signals is disabled on the interface, the device automatically notifies users that the interface is in Up state without detecting whether the interface is connected to an external cable.

Example

Enable detection of DSR and DTR signals on an async interface.

```
<Huawei> system-view
[Huawei] interface async 2/0/0
[Huawei-Async2/0/0] detect dsr-dtr
```

Related Topics

5.4.3 display interface async

5.4.3 display interface async

Function

The **display interface async** command displays the running status of and statistics about an async interface.

Format

display interface async [*interface-number*]

Parameters

Parameter	Description	Value
interface-number	Specifies the number of an async interface. If no interface number is specified, the running status of and statistics about all serial interfaces are displayed.	-

Copyright © Huawei Technologies Co., Ltd.

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

When monitoring the async interface status or locating faults on an async interface, you can run the **display interface async** command to view the running status of and statistics about the async interface. You can collect traffic statistics and locate faults on the async interface according to the command output.

Example

Display the status of Async 2/0/0.

```
<Huawei> display interface async 2/0/0
Async2/0/0 current state : UP
Line protocol current state : UP (spoofing)
Description:HUAWEI, Huawei Series, Async2/0/0 Interface
Route Port,The Maximum Transmit Unit is 1200, Hold timer is 10(sec)
Internet Address is 10.137.77.69/24
Last physical up time   : 2011-01-16 21:09:21
Last physical down time : 2011-01-16 21:08:31
Current system time: 2011-01-16 21:09:37
Physical layer is asynchronous, Baudrate is 9600 bps
Last 300 seconds input rate 0 bytes/sec 0 bits/sec 0 packets/sec
Last 300 seconds output rate 0 bytes/sec 0 bits/sec 0 packets/sec
Input: 0 packets, 0 bytes
  Broadcast:              0,  Multicast:              0
  Errors:                 0,  Runs:                   0
  Giants:                 0,  CRC:                    0

  Alignments:             0,  Overruns:               0
  Dribbles:               0,  Aborts:                 0
  No Buffers:             0,  Frame Error:            0

Output: 3 packets, 9 bytes
  Total Error:            0,  Overruns:               0
  Collisions:             0,  Deferred:               0

DCD=DOWN DTR=UP DSR=DOWN RTS=UP CTS=DOWN
    Input bandwidth utilization  :    0%
    Output bandwidth utilization :    0%
```

Table 5-22 Description of the display interface async command output

Item	Description
Async2/0/0 current state	Current physical status of the async interface: • UP: indicates that the interface is physically Up. • DOWN: indicates that the interface is physically Down. • Administratively down: indicates that the administrator has run the **shutdown** command on the interface.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Line protocol current state	Link layer protocol status of the interface: • UP: indicates that the link layer protocol status of the interface is Up. • DOWN: indicates that the link layer protocol status of the interface is Down or no IP address is assigned to the interface. **damping** indicates that the interface is suppressed because of frequent flapping.
Description	Description of the interface.
The Maximum Transmit Unit is	Maximum transmit unit (MTU) of the interface. By default, the MTU is 1488 bytes. Packets whose size is greater than the MTU are fragmented before being transmitted. If non-fragmentation is configured, these packets are discarded. You can run the **mtu** command to set the MTU.
Internet Address is	IP address and subnet mask of the interface.
Last physical up time	Last time the link layer protocol of the interface goes Up.
Last physical down time	Last time the link layer protocol of the interface goes Down.
Hold timer	Lifecycle of a packet. If a packet is not sent out before the hold timer times out, the packet is discarded.
Internet Address	IP address of the interface. If no IP address is assigned to the interface, the system displays "Internet protocol processing: disabled."
Link layer protocol	Link layer protocol of the serial interface.
Current system time	Current system time. If the time zone is configured and the daylight saving time is used, the time is in YYYY-MM-DD HH:MM:SS UTC±HH:MM DST format.
Interface is	Cable type of the serial interface.
Broadcasts	Number of broadcast packets received or sent by the interface.
Multicasts	Number of multicast packets received or sent by the interface.
Errors	Number of error packets detected at the physical layer.
Runts	Number of undersized frames with the correct FCS received by the interface.
Giants	Number of received jumbo frames with the correct FCS.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
CRC	Number of CRC error packets received by the interface.
Align errors	Number of received packets with alignment errors.
Overruns	Number of received packets above the upper limit of the FIFO queue.
Aborts	Number of received packets aborted unexpectedly.
No Buffers	Number of received packets that cannot be buffered.
Frame Errors	Number of received packets with frame errors.
Underruns	Number of sent packets below the lower limit of the FIFO queue.
Collisions	Number of sent packets with 1 to 15 conflict events.
Deferreds	Number of delayed packets without conflict.
Input	Total number of received packets.
Output	Total number of sent packets.
Input bandwidth utilization	Inbound bandwidth usage.
Output bandwidth utilization	Outbound bandwidth usage.

Related Topics

5.4.5 mtu (async)

5.4.4 interface async

Function

The **interface async** command displays the async interface view.

Format

interface async *interface-number*

Parameters

Parameter	Description	Value
interface-number	Specifies the number of an async interface.	-

Copyright © Huawei Technologies Co., Ltd.

Views

System view

Default Level

2: Configuration level

Usage Guidelines

To set attributes for an async interface, run the **interface async** command to enter the async interface view.

Example

Enter the view of Async 2/0/0.

```
<Huawei> system-view
[Huawei] interface async 2/0/0
[Huawei-Async2/0/0]
```

Related Topics

5.4.3 display interface async

5.4.5 mtu (async)

Function

The **mtu** command sets the MTU for an async interface.

The **undo mtu** command restores the default MTU.

By default, the MTU of an async interface is 1500 bytes.

Format

mtu *mtu*

undo mtu

Parameters

Parameter	Description	Value
mtu	Specifies the MTU of an async interface.	The value is an integer that ranges from 128 to 1500, in bytes.

Views

Serial interface view

Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The size of data frames is limited at the network layer. Any time the IP layer receives an IP packet, it checks to which local interface the packet needs to be sent and obtains the MTU configured on the interface. Then the IP layer compares the MTU with the packet length. If the packet length is longer than the MTU, the IP layer fragments the packet into smaller packets, which are shorter than the MTU.

If forcible unfragmentation is configured, some packets may be discarded during data transmission at the IP layer. Therefore, large packets must be forcibly fragmented to prevent packet loss on the network. In this case, you can run the **mtu** command to set the size of a fragment.

Configuration Impact

If you run the **mtu** command multiple times in the same async interface view, only the latest configuration takes effect.

Follow-up Procedure

Run the **shutdown** and **undo shutdown**/**restart** commands to restart the related physical interface to make the configuration take effect.

Example

Set the MTU of an async interface to 1200 bytes.

```
<Huawei> system-view
[Huawei] interface async 2/0/0
[Huawei-Async2/0/0] mtu 1200
[Huawei-Async2/0/0] restart
```

Related Topics

5.4.3 display interface async

5.4.6 phy-mru (async)

Function

The **phy-mru** command sets the maximum receive unit (MRU) for an async interface.

The **undo phy-mru** command restores the default MRU.

By default, the MRU of an async interface is 1700 bytes.

Format

phy-mru *mrusize*

 Copyright © Huawei Technologies Co., Ltd.

undo phy-mru

Parameters

Parameter	Description	Value
mrusize	Specifies the MRU of an async interface.	The value is an integer that ranges from 4 to 1700, in bytes.

Views

Async interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The MRU is the maximum size of a packet that can be received by an interface. The MTU of an async interface cannot be greater than the MRU of the interface, ensuring that both ends are capable of receiving packets from each other.

Configuration Impact

If you run the **phy-mru** command multiple times in the same async interface view, only the latest configuration takes effect.

Example

Set the MRU to 1200 bytes for an async interface.

```
<Huawei> system-view
[Huawei] interface async 2/0/0
[Huawei-Async2/0/0] phy-mru 1200
```

Related Topics

5.4.1 async mode (async)

5.5 CE1/PRI Interface Configuration Commands

5.5.1 channel-set (CE1/PRI interface view)

Function

Using the **channel-set** command, you can bundle timeslots of a CE1/PRI interface to form a channel set.

Copyright © Huawei Technologies Co., Ltd.

Using the **undo channel-set** command, you can cancel the configuration.

By default, no timeslot of a CE1/PRI interface is bundled to form a channel set.

Format

channel-set *set-number* **timeslot-list** *list*

undo channel-set [*set-number*]

Parameters

Parameter	Description	Value
set-number	Specifies the number of the channel set.	The value is an integer that ranges from 0 to 30.
timeslot-list *list*	Specifies the timeslot to be bundled.	*list* specifies the number of a timeslot, and its value ranges from 1 to 31. You can specify a single timeslot by using *number*, specify a timeslot range by using *number1-number2*, or specify multiple timeslots by using *number1,number2-number3*.

Views

CE1/PRI interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

In a family or a small enterprise, multiple terminals (such as telephones, fax machines, and computers) may share the same E1 link. In this situation, timeslots of the E1 link need to be bundled to form channel sets. Each channel set transmits a type of service. For example, 2 timeslots are used for voice transmission, and 16 timeslots are used for Internet access.

When a CE1/PRI interface works in CE1 mode, its 2 Mbit/s transmission line is divided into 32 timeslots at a rate of 64 kbit/s. Timeslot 0 transmits synchronization signals, and the remaining 31 timeslots can be bundled randomly to form multiple channel sets. Each channel set transmits a type of service.

After the **channel-set** command is run, a serial interface is created automatically. It has the same logical features as a synchronous serial interface. The number format of a serial interface is "serial *interface-number*.*set-number*". *interface-number* specifies the number of a CE1/PRI interface, and *set-number* specifies the number of a channel set.

Prerequisites

 Copyright © Huawei Technologies Co., Ltd.

A CE1/PRI interface has been configured to work in CE1/PRI mode by using the **using ce1** command.

Precautions

- The **channel-set** and **pri-set (CE1/PRI interface view)** commands cannot be used on the same CE1/PRI interface. That is, you can configure only one timeslot bundling mode on a CE1/PRI interface.
- Timeslots of a CE1 interface can be bundled to form a maximum of 31 channel sets and a minimum of 1 channel set. That is, a single timeslot can form a channel set, and 31 timeslots can be bundled to form one channel set.

  NOTE

  If you run the **channel-set** command in the same CE1/PRI interface view multiple times, multiple channel sets can be formed by bundling timeslots. One timeslot can be bundled to only one channel set.
- Channel sets on the local and remote CE1/PRI interfaces must contain the same timeslots; otherwise, errors will occur in communication.

Example

Bundle timeslots 1, 10 to 16, and 18 of CE1 1/0/0 to form channel set 0.

```
<Huawei> system-view
[Huawei] controller e1 1/0/0
[Huawei-E1 1/0/0] using ce1
[Huawei-E1 1/0/0] channel-set 0 timeslot-list 1,10-16,18
```

Related Topics

5.5.18 pri-set (CE1/PRI interface view)

5.5.21 using (CE1/PRI interface view)

5.5.2 clock (CE1/PRI interface view)

Function

Using the **clock** command, you can set the clock mode for a CE1/PRI interface.

Using the **undo clock** command, you can restore the default setting.

By default, a CE1/PRI interface works in slave clock mode.

Format

clock { **master** | **slave** | **system** }

undo clock

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
master	Configures a CE1/PRI interface to work in master clock mode and use internal clock signals. When a CE1/PRI interface functions as a Data Circuit-terminating Equipment (DCE), it must work in master clock mode and provide clock signals for a Data Terminal Equipment (DTE).	-
slave	Configures a CE1/PRI interface to work in slave clock mode and use line clock signals. When a CE1/PRI interface functions as a DTE, it must work in slave clock mode and obtain clock signals from a DCE.	-
system	Configures a CE1/PRI interface to work in system clock mode and use MPU clock signals. **NOTE** This parameter takes effect only when it is configured on interfaces of the 4E1T1-M/8E1T1-M interface card.	-

Views

CE1/PRI interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

To exchange data correctly, communicating parties must work in clock synchronization state.

A CE1/PRI interface supports the following clock modes:

- master: uses the internal clock signal.
- slave: uses the line clock signal.
- system: uses the MPU clock signal.

Precautions

When the router and a remote device are directly connected by using two CE1/PRI interfaces, the two CE1/PRI interfaces must work in master clock mode and slave clock mode.

When the MPU on the router obtains the clock with high accuracy from the upstream device and the router needs to synchronize the clock to downstream device, the interface on the router must be configured to work in system clock mode. Moreover, the interface on the downstream device must be configured to work in slave clock mode.

 Copyright © Huawei Technologies Co., Ltd.

Example

Configure CE1/PRI 1/0/0 to work in master clock mode.

```
<Huawei> system-view
[Huawei] controller e1 1/0/0
[Huawei-E1 1/0/0] clock master
```

5.5.3 controller e1

Function

Using the **controller e1** command, you can enter the view of a CE1/PRI interface.

Format

controller e1 *interface-number*

Parameters

Parameter	Description	Value
interface-number	Specifies the number of a CE1/PRI interface.	-

Views

System view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

To enter the CE1/PRI interface view, run the **controller e1** command.

Prerequisites

The 1E1T1-M/2E1T1-M/4E1T1-M/8E1T1-M interface card is configured to work in CE1/PRI mode, run the **set workmode slot** *slot-id* **e1t1 e1-data** command.

Example

Enter the view of CE1/PRI 1/0/0.

```
<Huawei> system-view
[Huawei] controller e1 1/0/0
[Huawei-E1 1/0/0]
```


Copyright © Huawei Technologies Co., Ltd.

5.5.4 crc

Function

The **crc** command configures the cyclic redundancy check (CRC) mode of a synchronous serial interface.

The **undo crc** command restores the default CRC mode of a synchronous serial interface.

By default, the 16-bit CRC is used.

Format

crc { **16** | **32** | **none** }

undo crc

Parameters

Parameter	Description	Value
16	Indicates the 16-bit CRC.	-
32	Indicates the 32-bit CRC.	-
none	Indicates that the synchronous serial interface does not perform CRC.	-

Views

Interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

CRC is a commonly used method to detect transmission errors in a communication system. It checks for transmission errors by adding redundancy codes to the original data. Transmission errors are more likely to be detected when more redundancy codes are added, but data is transmitted at a lower efficiency. Use the 16-bit or 32-bit CRC mode as required.

Precautions

- Interfaces that support CRC include:
  - Synchronous/asynchronous serial interfaces that work in synchronous mode. The interface name is Serial.

Copyright © Huawei Technologies Co., Ltd.

  - Interfaces formed by CE1/PRI and CT1/PRI interfaces. The interface name is Serial and the interface logic is the same as that of synchronous serial interfaces.
  - Interfaces formed by CE3 interfaces. The interface name is Serial and the interface logic is the same as that of synchronous serial interfaces.
  - Interfaces formed by E1-F and T1-F interfaces. The interface name is Serial and the interface logic is the same as that of synchronous serial interfaces.
  - Interfaces formed by E1/T1 interfaces that are channelized from CPOS interfaces. The interface name is Serial and the interface logic is the same as that of synchronous serial interfaces.
- The synchronous serial interfaces on both ends of a link must use the CRC of the same length. If lengths of the CRCs used on two ends are different, the two devices cannot communicate with each other.

Example

Set the CRC mode to 32-bit CRC on Serial 1/0/0/0:0.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0/0:0
[Huawei-Serial1/0/0/0:0] crc 32
```

5.5.5 data-coding (CE1/PRI interface view)

Function

Using the **data-coding** command, you can determine whether data is inverted by a CE1/PRI interface.

Using the **undo data-coding** command, you can restore the default setting.

By default, a CE1/PRI interface does not invert data.

Format

data-coding { **inverted** | **normal** }

undo data-coding

Parameters

Parameter	Description	Value
inverted	Configures a CE1/PRI interface to invert data.	-
normal	Configures a CE1/PRI interface not to invert data.	-

Views

CE1/PRI interface view

Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

Data inversion indicates that every "1" bit in the data stream becomes a "0" bit and every "0" bit becomes a "1" bit.

Two devices can communicate only when the same data inversion configuration is performed on CE1/PRI interfaces on both devices.

Example

Configure CE1/PRI 1/0/0 to invert data.

```
<Huawei> system-view
[Huawei] controller e1 1/0/0
[Huawei-E1 1/0/0] data-coding inverted
```

5.5.6 detect-ais (CE1/PRI interface view)

Function

Using the **detect-ais** command, you can enable alarm indication signal (AIS) detection on a CE1/PRI interface.

Using the **undo detect-ais** command, you can disable AIS detection.

By default, AIS detection is enabled on a CE1/PRI interface.

Format

detect-ais

undo detect-ais

Parameters

None

Views

CE1/PRI interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

AIS alarms are also called upstream alarms, indicating that the peer device or the receive link of the local device becomes faulty.

 Copyright © Huawei Technologies Co., Ltd.

If the number of 0s in 512 consecutive bits (two consecutive frames) of a received signal is smaller than 3, an AIS alarm is generated. If the number of 0s in 512 consecutive bits of a received signal is greater than or equal to 3, an AIS alarm is cleared.

If AIS detection is enabled, the local device sends a message carrying the remote alarm indication (RAI) bit to the peer device after detecting AIS alarms.

Prerequisites

The CE1/PRI interface has been configured to work in E1 mode by using the **using e1** command.

Example

Enable AIS detection on CE1/PRI 1/0/0.

```
<Huawei> system-view
[Huawei] controller e1 1/0/0
[Huawei-E1 1/0/0] using e1
[Huawei-E1 1/0/0] detect-ais
```

5.5.7 detect-rai (CE1/PRI interface view)

Function

Using the **detect-rai** command, you can enable remote alarm indication (RAI) detection on a CE1/PRI interface.

Using the **undo detect-rai** command, you can disable RAI detection.

By default, RAI detection is enabled on a CE1/PRI interface.

Format

detect-rai

undo detect-rai

Parameters

None

Views

CE1/PRI interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

 Copyright © Huawei Technologies Co., Ltd.

If RAI detection is enabled, a device sends an RAI alarm to its peer device after detecting loss of frame (LoF) caused by clock asynchronization or loss of signal (LOS).

Prerequisites

The CE1/PRI interface has been configured to work in CE1/PRI mode by using the **using ce1** command.

Example

Disable RAI detection on CE1/PRI 1/0/0.

```
<Huawei> system-view
[Huawei] controller e1 1/0/0
[Huawei-E1 1/0/0] undo detect-rai
```

5.5.8 display controller e1

Function

Using the **display controller e1** command, you can view information about a CE1/PRI interface.

Format

display controller [**e1** [*interface-number*]]

Parameters

Parameter	Description	Value
interface-number	Displays information about a specified CE1/PRI interface.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

When monitoring the interface status or locating faults on an interface, run the **display controller e1** command to obtain the configuration information and alarm state of the interface. You can locate faults on the interface according to the command output.

Example

Display information about CE1/PRI 1/0/0.

 Copyright © Huawei Technologies Co., Ltd.

```
<Huawei> display controller e1 1/0/0
E1 1/0/0 current state : UP
Description : HUAWEI, AR Series, E1 1/0/0 Interface
Basic Configuration:
  Work Mode is E1 Framed, Cable type is 120 Ohm balanced.
  Frame-format is NO-CRC4, Line Code is Hdb3.
  Source Clock is Slave, Data-coding is Normal.
  Idle code is 7E, Itf type is 7E, Itf number is 4.
  Loopback is Not Set.
Alarm State:
  Receiver alarm state is Loss-of-Frame.
  Transmitter is sending remote alarm.
Historical Statistics:
  Data in current interval (0 seconds elapsed):
  0 Line Code Violations, 0 Path Code Violations
  0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
  0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
  Total Data (last 24 hours):
  0 Line Code Violations, 0 Path Code Violations
  0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
  0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
```

Table 5-23 Description of the display controller e1 command output

Item	Sub-Item	Description
current state	-	Physical status of the interface. • UP: indicates that the interface is physically Up. • DOWN: indicates that the interface is physically Down.
Description	-	Description of the interface.
Basic Configuration	Work Mode	Working mode of the interface. • E1 UNFRAMED: indicates that the interface works in E1 mode. • E1 FRAMED: indicates that the interface works in CE1/PRI mode. To configure the working mode for a CE1/PRI interface, run the **using (CE1/PRI interface view)** command.
Basic Configuration	Cable type	Type of the cable connected to the CE1/PRI interface. The value can be: • 120 Ohm: indicates a balanced cable (twisted pair). • 75 Ohm: indicates a non-balanced cable (coaxial cable).

Copyright © Huawei Technologies Co., Ltd.

Item	Sub-Item	Description
Basic Configuration	Frame-format	Frame format of the interface, which can be CRC4 or NO-CRC4. To configure the frame format for a CE1/PRI interface, run the **frame-format (CE1/PRI interface view)** command. • CRC4: indicates that the frame format is a multi-frame. • NO-CRC4: indicates that the frame format is a basic frame, which is also called a dual-frame or an odd-even frame.
Basic Configuration	Line Code	Encoding and decoding mode of the interface.
Basic Configuration	Source Clock	Clock mode of the interface, which can be master or slave. To configure the clock mode for a CE1/PRI interface, run the **clock (CE1/PRI interface view)** command. • MASTER: indicates that the interface works in master clock mode and uses the internal clock signal. • SLAVE: indicates that the interface works in slave clock mode and uses the line clock signal.
Basic Configuration	Idle code	Line idle code of the interface, which can be 7E or FF. To configure the line idle code for a CE1/PRI interface, run the **idlecode (CE1/PRI interface view)** command.
Basic Configuration	Itf type	Interframe filling tag of the interface, which can be 7E or FF. To configure the interframe filling tag for a CE1/PRI interface, run the **itf (CE1/PRI interface view)** command.
Basic Configuration	Itf number	Number of interframe filling tags, which ranges from 0 to 14. To configure the number of interframe filling tags on a CE1/PRI interface, run the **itf (CE1/PRI interface view)** command.
Basic Configuration	Loopback	Whether loopback detection is enabled on the interface. If loopback detection has been enabled, the loopback detection mode is displayed. To configure loopback detection on a CE1/PRI interface, run the **loopback (CE1/PRI interface view)** command. **NOTE** The loopback detection function detects the interface status or cable status and must be disabled when devices work properly.

Copyright © Huawei Technologies Co., Ltd.

Item	Sub-Item	Description
Alarm State	Receiver alarm state is Loss-of-Frame.	No alarm is received. If an alarm is generated, the specific alarm type is displayed. The following alarms may be generated: ● Loss-of-Signal (LOS): This alarm is generated when data transmission is interrupted or frames are lost because of severe problems, for example, the cable is broken or is not well connected. ● Alarm-Indication-Signal (AIS): This alarm is generated when the remote end fails to receive the frame alignment signals. This alarm generally indicates a fault on the remote device and is also called the upstream alarm. ● Loss-of-Frame (LOF): This alarm is generated when signals cannot be encapsulated in frames. It is usually generated with a LOS alarm and is cleared when frame alignment succeeds. ● Remote-Alarm-Indication (RAI): This alarm is generated when the remote end does not receive frames from the local end for some reasons, for example, the local end fails to send frames, the transmission line of the local end fails, or the remote end fails to receive frames. When a LOS, AIS, or LOF alarm is generated, the local end needs to send the RAI bit to the remote end. In addition, "Transmitter is sending remote alarm." is displayed.
Historical Statistics	Data in current interval	The current accumulation period.
Historical Statistics	Line Code Violations	Count of both Bipolar Violations (BPVs) and Excessive Zeros (EXZs) occurring over the accumulation period.
Historical Statistics	Path Code Violations	Frame synchronization bit error in the E1-noCRC formats or a CRC error in the E1-CRC formats.
Historical Statistics	Slip Secs	A second with one or more out of frame defects or a detected incoming AIS.
Historical Statistics	Fr Loss Secs	Number of seconds an Out Of Frame (OOF) error is detected.
Historical Statistics	Line Err Secs	A second in which one or more code violations occurred or one or more LOS defects.

Copyright © Huawei Technologies Co., Ltd.

Item	Sub-Item	Description
Historical Statistics	Degraded Mins	One in which the estimated error rate exceeds 1E-6 but does not exceed 1E-3.
Historical Statistics	Errored Secs	A second with one or more path coding violations, one or more Out of Frame defects, or one or more controlled slip events or a detected AIS defect.
Historical Statistics	Bursty Err Secs	A second with fewer than 320 and more than one path coding violation error events, no Severely Errored Frame defects, and no detected incoming AIS defects.
Historical Statistics	Severely Err Secs	A second with 320 or more path code violation errors events, one or more Out of Frame defects, or a detected AIS defect.
Historical Statistics	Unavail Secs	Number of seconds that the interface is unavailable.
Historical Statistics	Total Data	Displays total accumulated data for all intervals.

5.5.9 display workmode

Function

The **display workmode** command displays the working modes of interface cards.

Format

display workmode { **slot** *slot-id* | **all** }

Parameters

Parameter	Description	Value
slot *slot-id*	Displays the working mode of an interface card in a specified slot.	The value must be the slot ID of an interface card with a configurable working mode. The working mode of the following interface cards can be changed: 1E1T1-M/2E1T1-M, 1E1T1-F/2E1T1-F, 4G.SHDSL, VDSL2, 1CPOS-155M, 4STM1 and 2BST.

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
all	Displays the working mode of all interface cards with configurable working modes.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

This command applies to only the interface cards with configurable working mode. To configure the working mode of an interface card, run the **set workmode e1t1**, **set workmode e1t1-f**, **set workmode shdsl**, **set workmode vdsl**, **set workmode cpos**, **set workmode stm** or **set workmode bri** command.

Example

Display the working mode of the interface card in slot 2.

```
<Huawei> display workmode slot 2
-------------------------------------------------------------------------
Slot  Type              config-workmode     active-workmode
-------------------------------------------------------------------------
2     1CPOS-155M-W      e1-data             e1-data
```

Table 5-24 Description of the display workmode command output

Item	Description
Slot	Slot ID of the interface card.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
Type	Interface card type: • 1E1/T1-M • 2E1/T1-M • 4E1/T1-M • 8E1/T1-M • 1E1/T1-F • 2E1/T1-F • 4E1/T1-F • 8E1/T1-F • 4G.SHDSL • VDSL2 • 1CPOS-155M • 4STM1 • 2BST

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
config-workmode	config working mode: ● e1-data: The interface card works in CE1/PRI mode. ● e1-voice: The interface card is configured as an E1 voice card. ● t1-data: The interface card works in CT1/PRI mode. ● t1-voice: The interface card is configured as an T1 voice card. ● stm1: The interface card works in 4stm mode, that is, it provides four interfaces working at the rate of 155 Mbit/s. ● stm4: The interface card works in 1stm mode, that is, it provides one interface working at the rate of 622 Mbit/s. ● e1-f: The interface card works in E1-F mode. ● t1-f: The interface card works in T1-F mode. ● atm: The 4G.SHDSL interface card works in ATM mode. ● ptm: The 4G.SHDSL interface card works in PTM mode. ● bri-voice-nt: The voice interface card works in NT mode. ● bri-voice-te: The voice interface card works in TE mode.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
active-workmode	active working mode: • e1-data: The interface card works in CE1/PRI mode. • e1-voice: The interface card is configured as an E1 voice card. • t1-data: The interface card works in CT1/PRI mode. • t1-voice: The interface card is configured as an T1 voice card. • stm1: The interface card works in 4stm mode, that is, it provides four interfaces working at the rate of 155 Mbit/s. • stm4: The interface card works in 1stm mode, that is, it provides one interface working at the rate of 622 Mbit/s. • e1-f: The interface card works in E1-F mode. • t1-f: The interface card works in T1-F mode. • atm: The 4G.SHDSL interface card works in ATM mode. • ptm: The 4G.SHDSL interface card works in PTM mode. • bri-voice-nt: The voice interface card works in NT mode. • bri-voice-te: The voice interface card works in TE mode.

5.5.10 error-diffusion restraint config

Function

The **error-diffusion restraint config** command configures the error packet diffusion restraint parameters.

The **undo error-diffusion restraint config** command restores the default settings of the error packet diffusion restraint parameters.

By default, the detection time is 30 seconds, the renewal time is 600 seconds, and the error packet threshold percentage is 20%.

Format

error-diffusion restraint config *detect-timer renew-timer threshold*

Copyright © Huawei Technologies Co., Ltd.

undo error-diffusion restraint config

Parameters

Parameter	Description	Value
detect-timer	Configures the detection timer.	The value is an integer that ranges from 30 to 600, in seconds. The default value is 30.
renew-timer	Configures the renewal timer.	The value is an integer that ranges from 120 to 2400, in seconds. The default value is 600.
threshold	Configures the error packet threshold percentage.	The value is an integer that ranges from 5 to 100. The default value is 20.

Views

System view

Default Level

2: Configuration level

Usage Guidelines

After error packet diffusion restraint is enabled, the device considers that an interface is faulty and forcibly disables the interface when the error packet rate on the interface exceeds the value of *threshold* within the time specified by *detect-timer*. After the time specified by *renew-timer*, the interface is restored to the normal state.

The value of *renew-timer* cannot be smaller than four times the value of *detect-timer*.

Example

Configure the detection timer to 100 seconds, renewal timer to 2400 seconds, and error packet threshold to 15% for error packet diffusion restraint.

```
<Huawei> system-view
[Huawei] error-diffusion restraint config 100 2400 15
```

5.5.11 error-diffusion restraint enable

Function

The **error-diffusion restraint enable** command enables the error packet diffusion restraint function.

The **undo error-diffusion restraint enable** command disables the error packet diffusion restraint function.

Copyright © Huawei Technologies Co., Ltd.

By default, the error packet diffusion restraint function is disabled.

Format

error-diffusion restraint enable

undo error-diffusion restraint enable

Parameters

None

Views

System view

Default Level

2: Configuration level

Usage Guidelines

After a timeslot receives specified error packets, other timeslots will receive error packets consecutively. This is called error packet diffusion. You can configure the error packet diffusion restraint function to reduce the error packet diffusion probability.

Example

Disable the error packet diffusion restraint function.

```
<Huawei> system-view
[Huawei] undo error-diffusion restraint enable
```

5.5.12 error-diffusion restraint restart-channel

Function

The **error-diffusion restraint restart-channel** command restarts the interface that is disabled because of the error packet diffusion restraint function.

By default, this function is disabled.

Format

error-diffusion restraint restart-channel serial *interface-number*

Parameters

Parameter	Description	Value
serial *interface-number*	Specifies the number of an interface.	Only a CE1/PRI interface is supported.

Copyright © Huawei Technologies Co., Ltd.

Views

System view

Default Level

2: Configuration level

Usage Guidelines

After error packet diffusion restraint is enabled, the device considers that an interface is faulty and forcibly disables the interface when the error packet rate on the interface exceeds the value of *threshold* within the time specified by *detect-timer*. After the time (in seconds) specified by *renew-timer*, the interface is restored to the normal state. You can run this command to enable the disabled interface before the time specified by *renew-timer*.

Example

Restart the interface Serial 1/0/0:10 that is disabled because of the error packet diffusion restraint function.

```
<Huawei> system-view
[Huawei] error-diffusion restraint restart-channel serial 1/0/0:10
```

5.5.13 frame-format (CE1/PRI interface view)

Function

Using the **frame-format** command, you can set the frame format for a CE1/PRI interface.

Using the **undo frame-format** command, you can restore the default setting.

By default, the frame format of a CE1/PRI interface is non-CRC4.

Format

frame-format { **crc4** | **no-crc4** }

undo frame-format

Parameters

Parameter	Description	Value
crc4	Sets the frame format to CRC4.	-
no-crc4	Sets the frame format to non-CRC4.	-

Views

CE1/PRI interface view

 Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

A CE1/PRI interface functioning as a CE1 interface supports both CRC4 and non-CRC4.

- CRC4: indicates that the frame format is a multi-frame. A multi-frame is formed by using the first bit of timeslot 0 and contains 16 consecutive PCM frames.
- Non-CRC4: indicates that the frame format is a basic frame. A basic frame is also called a dual-frame or an odd-even frame.

The multi-frame format supports CRC4, whereas the basic frame format does not support CRC4.

Prerequisites

The CE1/PRI interface has been configured to work in CE1/PRI mode by using the **using ce1** command.

Precautions

Two devices can communicate properly only when the same frame format is set for CE1/PRI interfaces on both devices. Otherwise, a CRC4 alarm is generated.

Example

Set the frame format to CRC4 for CE1 1/0/0.

```
<Huawei> system-view
[Huawei] controller e1 1/0/0
[Huawei-E1 1/0/0] frame-format crc4
```

5.5.14 idlecode (CE1/PRI interface view)

Function

Using the **idlecode** command, you can set the line idle code for a CE1/PRI interface.

Using the **undo idlecode** command, you can restore the default setting.

By default, the line idle code of a CE1/PRI interface is 0x7e.

Format

idlecode { **7e** | **ff** }

undo idlecode

 Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
7e	Sets the line idle code to 0x7e.	-
ff	Sets the line idle code to 0xff.	-

Views

CE1/PRI interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

A CE1/PRI interface transmits electrical signals, and therefore the interface line keeps transmitting data. When no data is being transmitted, a line idle code needs to be filled.

The line idle code is the code sent over the timeslot that is not bundled to form a logical channel.

A CE1/PRI interface supports two line idle codes: 0x7e and 0xff. The default line idle code 0x7e is recommended.

Precautions

- If you run the **idlecode** command multiple times in the same CE1/PRI interface view, only the latest configuration takes effect.
- Two devices can communicate properly only when the same line idle code is set for CE1/PRI interfaces on both devices.

Example

Set the line idle code to 0xff for CE1/PRI 1/0/0.

```
<Huawei> system-view
[Huawei] controller e1 1/0/0
[Huawei-E1 1/0/0] idlecode ff
```

5.5.15 itf (CE1/PRI interface view)

Function

The **itf** command sets the interframe filling tag and the number of interframe filling tags on a CE1/PRI interface.

The **undo itf** command restores the default setting.

Copyright © Huawei Technologies Co., Ltd.

By default, a CE1/PRI interface uses the interframe filling tag 0x7e and four interframe filling tags.

Format

itf { **number** *number* | **type** { **7e** | **ff** } }

undo itf { **number** | **type** }

Parameters

Parameter	Description	Value
number *number*	Specifies the number of interframe filling tags.	The value is an integer that ranges from 0 to 14.
type	Specifies the interframe filling tag.	-
7e	Sets the interframe filling tag to 0x7e.	-
ff	Sets the interframe filling tag to 0xff.	-

Views

CE1/PRI interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The interframe filling tag is the code sent when the timeslot bundled to form a logical channel does not send any service data.

A CE1/PRI interface supports two interframe filling tags: 0x7e and 0xff. The default interframe filling tag 0x7e is recommended.

Precautions

- Two devices can communicate properly only when the same interframe filling tag and the same number of interframe filling tags are set on CE1/PRI interfaces on both devices.
- A CE1/PRI interface cannot achieve the bandwidth because of extra costs of interframe filling tags. To improve the transmission rate of the CE1/PRI interface, run the **itf number** command to set the number of interframe filling tags to 0.

 Copyright © Huawei Technologies Co., Ltd.

Example

Set the interframe filling tag to 0xff on CE1/PRI 1/0/0.

```
<Huawei> system-view
[Huawei] controller e1 1/0/0
[Huawei-E1 1/0/0] itf type ff
```

5.5.16 line-termination

Function

Using the **line-termination** command, you can set the cable type for a CE1/PRI interface.

Using the **undo line-termination** command, you can restore the default setting.

By default, a CE1/PRI interface connects to a 120 ohm balanced cable (twisted pair).

Format

line-termination { **75-ohm** | **120-ohm** }

undo line-termination

Parameters

Parameter	Description	Value
75-ohm	Indicates that the CE1/PRI interface connects to a 75 ohm non-balanced cable (coaxial cable).	-
120-ohm	Indicates that the CE1/PRI interface connects to a 120 ohm balanced cable (twisted pair).	-

Views

CE1/PRI interface view

Default Level

2: Configuration level

Usage Guidelines

A CE1/PRI interface can connect to a twisted pair or coaxial cable. The resistance of a twisted pair is 120 ohm, and the resistance of a coaxial cable is 75 ohm.

If the type of the cable connected to a CE1/PRI interface changes, use this command to change the cable type.

 Copyright © Huawei Technologies Co., Ltd.

Example

Set the cable type to coaxial cable for CE1/PRI 1/0/0.

```
<Huawei> system-view
[Huawei] controller e1 1/0/0
[Huawei-E1 1/0/0] line-termination 75-ohm
```

5.5.17 loopback (CE1/PRI interface view)

Function

Using the **loopback** command, you can enable loopback detection and set the loopback detection mode on a CE1/PRI interface.

Using the **undo loopback** command, you can restore the default setting.

By default, loopback detection is disabled.

Format

loopback { **local** | **payload** | **remote** }

undo loopback

Parameters

Parameter	Description	Value
local	Sets internal loopback.	-
payload	Sets payload loopback.	-
remote	Sets external loopback.	-

Views

CE1/PRI interface view

Default Level

2: Configuration level

Usage Guidelines

The loopback detection function detects the interface status or cable status and must be disabled when devices work properly.

- In internal loopback mode, the local device loops back outgoing packets to itself to test whether it works properly.
- In payload loopback mode, the local device loops back the valid payload of outgoing packets to itself. Generally, the synchronization signals transmitted by timeslot 0 are not looped back to the local device.

 Copyright © Huawei Technologies Co., Ltd.

- In external loopback mode, the local device loops back the packets received from its peer device to the peer device to test whether the link between the two devices works properly.

Example

Enable internal loopback detection on CE1/PRI 1/0/0.

```
<Huawei> system-view
[Huawei] controller e1 1/0/0
[Huawei-E1 1/0/0] loopback local
```

5.5.18 pri-set (CE1/PRI interface view)

Function

Using the **pri-set** command, you can bundle timeslots of a CE1/PRI interface to form a PRI set.

Using the **undo pri-set** command, you can cancel the configuration.

By default, no timeslot of a CE1/PRI interface is bundled to form a PRI set.

NOTE

Timeslots of a CE1/PRI interface on the 1E1T1-M/2E1T1-M/4E1T1-M/8E1T1-M interface card can be bundled to form a PRI set.

Format

pri-set [**timeslot-list** *list*]

undo pri-set

Parameters

Parameter	Description	Value
timeslot-list *list*	Specifies the timeslot to be bundled. If this parameter is not specified, all timeslots except timeslot 0 are bundled to form an ISDN PRI interface at a rate of 30B+D.	*list* specifies the number of a timeslot, and its value ranges from 1 to 31. Timeslot 16 alone cannot be bundled to form an ISDN PRI interface. You can specify a single timeslot by using *number*, specify a timeslot range by using *number1-number2*, or specify multiple timeslots by using *number1,number2-number3*.

Views

CE1/PRI interface view

Default Level

2: Configuration level

Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

Usage Scenario

To use a CE1/PRI interface to transmit voice service data and ISDN signals, run the **pri-set** command to bundle timeslots of the CE1/PRI interface to form an ISDN PRI interface.

When a CE1/PRI interface functions as a PRI interface, timeslot 16 functions as the D channel to transmit signals. Therefore, only one group of timeslots except timeslots 0 and 16 can be randomly selected to function as B channels, and then these B channels are bundled with timeslot 16 to form a PRI set. The PRI set functions as a PRI interface.

After the **pri-set** command is run, a serial interface is created automatically. It has the same logical features as an ISDN PRI interface. The number format of a serial interface is "serial *interface-number*:15". *interface-number* specifies the number of a CE1/PRI interface.

Prerequisites

A CE1/PRI interface has been configured to work in CE1/PRI mode by using the **using ce1** command.

Precautions

- The **pri-set** and **channel-set** commands cannot be used on the same CE1/PRI interface. That is, you can configure only one timeslot bundling mode on a CE1/PRI interface.
- Before running the **undo pri-set** command, run the **shutdown** command to disable the specified serial interface.
- Channel sets on the local and remote CE1/PRI interfaces must contain the same timeslots; otherwise, errors will occur in communication.

Example

Bundle timeslots 1, 5 to 8, and 16 of CE1/PRI 1/0/0 to form a PRI set.

```
<Huawei> system-view
[Huawei] controller e1 1/0/0
[Huawei-E1 1/0/0] pri-set timeslot-list 1,5-8,16
```

Related Topics

5.5.1 channel-set (CE1/PRI interface view)

5.5.21 using (CE1/PRI interface view)

5.5.19 sa (CE1/PRI interface view)

Function

The **sa** command sets the content of the five outgoing sa bits.

The **undo sa** command restores the default setting.

By default, the content of the five outgoing sa bits is 0.

Copyright © Huawei Technologies Co., Ltd.

Format

sa *sa4 sa5 sa6 sa7 sa8*

undo sa

Parameters

Parameter	Description	Value
sa4	Specifies the content of the outgoing sa4 bit.	The value is an integer that ranges from 0 to 255.
sa5	Specifies the content of the outgoing sa5 bit.	The value is an integer that ranges from 0 to 255.
sa6	Specifies the content of the outgoing sa6 bit.	The value is an integer that ranges from 0 to 255.
sa7	Specifies the content of the outgoing sa7 bit.	The value is an integer that ranges from 0 to 255.
sa8	Specifies the content of the outgoing sa8 bit.	The value is an integer that ranges from 0 to 255.

Views

CE1/PRI interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

When the CE1/PRI interface works in CE1/PRI mode, SA4 to SA8 in the E1 frame can be used for transmitting low-speed data. By default, the values of SA4 to SA8 are 0. In some scenarios, the remote device will check received SA fields. Therefore, SA fields must be configurable on the router to ensure normal connection of the CE1/PRI interface.

Prerequisites

The CE1/PRI interface has been configured to work in CE1/PRI mode by using the **using ce1** command.

Precautions

By default, the SA field value is 0. Before configuring the SA field, collect configuration information on the remote device.

 Copyright © Huawei Technologies Co., Ltd.

Example

Set the content of five outgoing sa bits to 1, 2, 3, 4, and 5 respectively.

```
<Huawei> system-view
[Huawei] controller e1 1/0/0
[Huawei-E1 1/0/0] sa 1 2 3 4 5
```

5.5.20 set workmode e1t1

Function

The **set workmode e1t1** command sets the working mode of a 1E1T1-M/2E1T1-M interface card.

By default, a 1E1T1-M/2E1T1-M interface card works in CE1/PRI mode (e1-data).

NOTE

The 4E1T1-M/8E1T1-M interface card only works in CE1/PRI mode (e1-data) and does not support working mode switching.

Format

set workmode slot *slot-id* **e1t1** { **e1-data** | **t1-data** | **e1-voice** | **t1-voice** }

Parameters

Parameter	Description	Value
slot *slot-id*	Specifies the slot ID of a 1E1T1-M/2E1T1-M interface card.	Run the **display device** command to view slot IDs and types of interface cards and find the slot ID with E1/T1-M displayed. Then run the **display workmode** command to view the interface card work mode on the device.
e1-data	Indicates a 1E1T1-M/2E1T1-M interface card works in CE1/PRI mode and functions as an E1 data card.	-
t1-data	Indicates a 1E1T1-M/2E1T1-M interface card works in CT1/PRI mode and functions as a T1 data card.	-
e1-voice	Indicates a 1E1T1-M/2E1T1-M interface card functions as a E1 voice card.	-
t1-voice	Indicates a 1E1T1-M/2E1T1-M interface card functions as a T1 voice card.	-

Copyright © Huawei Technologies Co., Ltd.

Views

System view

Default Level

3: Management level

Usage Guidelines

Usage Scenario

A 1E1T1-M interface card provides one E1/T1/PRI/VE1/VT1 interface and a 2E1T1-M interface card provides two E1/T1/PRI/VE1/VT1interfaces. The **set workmode e1t1** command sets the working mode of a 1E1T1-M/2E1T1-M interface card.

Precautions

After this command is used, the system prompts you to reset the 1E1T1-M/2E1T1-M interface card to make the new working mode take effect. If you select **Yes**, the system resets the interface card. Otherwise, you need to run the **reset slot** command to manually reset the interface card to make the new working mode take effect.

Example

Configure the 2E1T1-M interface card in slot 1 to functions as a T1 data card.

```
<Huawei> system-view
[Huawei] set workmode slot 1 e1t1 t1-data
Warning: Changing the working mode will reset the board in slot 1. Continue? [y/
n]:y
INFO: Resetting board[1] succeeded.
```

Configure the 2E1T1-M interface card in slot 1 to functions as an E1 voice card.

```
<Huawei> system-view
[Huawei] set workmode slot 1 e1t1 e1-voice
Warning: Changing the working mode will reset the board in slot 1. Continue? [y/
n]:y
INFO: Resetting board[1] succeeded.
```

Related Topics

4.1.3 display device

5.5.9 display workmode

4.2.13 reset slot

5.5.21 using (CE1/PRI interface view)

Function

Using the **using** command, you can set the working mode for a CE1/PRI interface.

Using the **undo using** command, you can restore the default setting.

By default, a CE1/PRI interface works in CE1/PRI mode.

 Copyright © Huawei Technologies Co., Ltd.

Format

using { **ce1** | **e1** }

undo using

Parameters

Parameter	Description	Value
ce1	Sets the working mode to CE1/PRI.	-
e1	Sets the working mode to E1.	-

Views

CE1/PRI interface view

Default Level

2: Configuration level

Usage Guidelines

A CE1/PRI interface works in either E1 mode or CE1/PRI mode.

- In E1 mode, a CE1/PRI interface works at a rate of 2.048 Mbit/s without timeslot division. Similar to a synchronous serial interface, a CE1/PRI interface supports link layer protocols (such as PPP and FR) and network protocols (such as IP).
- In CE1/PRI mode, the 2 Mbit/s transmission line of a CE1/PRI interface is divided into 32 timeslots at a rate of 64 kbit/s. The 32 timeslots are numbered 0 to 31, and timeslot 0 transmits synchronization signals.

  The CE1/PRI interface working in CE1/PRI mode functions as either a CE1 interface or a PRI interface.

  - When the CE1/PRI interface functions as a CE1 interface, timeslots except timeslot 0 can be randomly bundled to form multiple channel sets. Each channel set corresponds to a channel. Each group of bundled timeslots functions as an interface, which has the same logical features as a synchronous serial interface and supports link layer protocols (such as PPP, HDLC, and FR) and network protocols (such as IP).

    To bundle timeslots to form a channel set, run the **channel-set (CE1/PRI interface view)** command.
  - When the CE1/PRI interface functions as a PRI interface, timeslot 16 functions as the D channel to transmit signals. Therefore, only one group of timeslots except timeslots 0 and 16 can be randomly selected to function as B channels, and then these B channels are bundled with timeslot 16 to form a PRI set. The PRI set functions as an ISDN PRI interface, which supports link layer protocols such as PPP and network protocols such as IP, and can be configured with DCC parameters.

 Copyright © Huawei Technologies Co., Ltd.

To bundle timeslots to form a PRI set, run the **pri-set (CE1/PRI interface view)** command.

To use a dedicated E1 line (with the 2 Mbit/s bandwidth) to transmit data, configure a CE1/PRI interface to work in E1 mode. To use multiple low-rate (128 kbit/s or 256 kbit/s) channels to transmit different services or use a CE1/PRI interface as a PRI interface, configure the CE1/PRI interface to work in CE1/PRI mode.

Example

Configure CE1/PRI 1/0/0 to work in E1 mode.

```
<Huawei> system-view
[Huawei] controller e1 1/0/0
[Huawei-E1 1/0/0] using e1
```

Related Topics

5.5.1 channel-set (CE1/PRI interface view)

5.5.18 pri-set (CE1/PRI interface view)

5.6 CT1/PRI Interface Configuration Commands

5.6.1 alarm-threshold

Function

Using the **alarm-threshold** command, you can configure alarm thresholds for a CT1/PRI interface.

Using the **undo alarm-threshold** command, you can restore the default alarm thresholds for a CT1/PRI interface.

The default alarm thresholds are as follows:

- Alarm indication signal (AIS) alarm: level-1.
- Loss of frame alignment (LFA) alarm: level-1.
- Loss of signal (LOS) alarm: The value of pulse-detection is 176 and the value of pulse-recovery is 22, indicating that a LOS alarm is generated if less than 22 pulses are detected within 176 pulse intervals.

Format

alarm-threshold { **ais** { **level-1** | **level-2** } | **lfa** { **level-1** | **level-2** | **level-3** | **level-4** } | **los** { **pulse-detection** *value* | **pulse-recovery** *value* } }

undo alarm-threshold { **ais** | **lfa** | **los** { **pulse-detection** | **pulse-recovery** } }

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
ais { **level-1** | **level-2** }	Sets the AIS alarm threshold. • **level-1**: indicates that an AIS alarm is generated when there are less than two 0s in the bit stream of a super frame (SF) or extended super frame (ESF). • **level-2**: indicates that an AIS is generated when there is less than three 0s in the code stream of an SF or less than five 0s in the code stream of an ESF.	The default AIS alarm threshold is **level-1**.
lfa { **level-1** | **level-2** | **level-3** | **level-4** }	Sets the loss of frame alignment (LFA) alarm threshold. • **level-1**: indicates that an LFA alarm is generated when two of four frame alignment bits are lost.**level-2**: indicates that an LFA alarm is generated when two of five frame alignment bits are lost. • **level-3**: indicates that an LFA alarm is generated when two of six frame alignment bits are lost.**level-4**: indicates that an LFA alarm is generated when errors occur in four consecutive ESF frames. This keyword is valid only for the ESF format.	The default LFA alarm threshold is **level-1**.
los { **pulse-detection** *value* | **pulse-recovery** *value* }	Sets the LOS alarm threshold. • **pulse-detection** specifies the LOS detection period, expressed by the number of pulse intervals. • **pulse-recovery** specifies the pulse threshold. A LOS alarm is generated when the number of pulses detected within the specified number of pulse intervals is less than the value of **pulse-recovery**.	The value of **pulse-detection** ranges from 16 to 4096, and the value of **pulse-recovery** ranges from 1 to 256. By default, the value of **pulse-detection** is 176 and the value of **pulse-recovery** is 22, indicating that a LOS alarm is generated if less than 22 pulses are detected within 176 pulse intervals.

Copyright © Huawei Technologies Co., Ltd.

Views

CT1/PRI interface view

Default Level

2: Configuration level

Usage Guidelines

None

Example

Set the LOS detection period to 300 pulse intervals.

```
<Huawei> system-view
[Huawei] controller t1 1/0/0
[Huawei-T1 1/0/0] alarm-threshold los pulse-detection 300
```

5.6.2 cable

Function

Using the **cable** command, you can set the attenuation or length of the transmission line matching a CT1/PRI interface.

Using the **undo cable** command, you can restore the default transmission line configuration.

The default attenuation of the transmission line on a CT1/PRI interface is -7.5 db.

Format

cable { **long** { **-7.5db** | **-15db** | **-22.5db** } | **short** { **133ft** | **266ft** | **399ft** | **533ft** | **655ft** } }

undo cable

Parameters

Parameter	Description	Value
long { **-7.5db** | **-15db** | **-22.5db** }	Sets the attenuation of the transmission line matching the CT1/PRI interface. This parameter is applicable to transmission lines longer than 655 feet. The attenuation of such transmission lines can be -7.5 db, -15 db, or -22.5 db. Set the attenuation based on quality of received signals. Transmission lines with a lower quality have a larger attenuation. When received signals are of low quality, set this parameter to offset the attenuation.	-

 Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
short { **133ft** | **266ft** | **399ft** | **533ft** | **655ft** }	Sets the length of the transmission line matching the CT1/PRI interface. This parameter is applicable to transmission lines not longer than 665 feet. The length can be 133 feet, 266 feet, 399 feet, 533 feet, or 655 feet.	-

Views

CT1/PRI interface view

Default Level

2: Configuration level

Usage Guidelines

This command is required only when received signals are of a low quality. The command determines the waveform of transmitted signals.

When signals that the device receives are of a good quality, use the default configuration.

Example

Set the length of the transmission line matching CT1/PRI 1/0/0 to 133 feet.

```
<Huawei> system-view
[Huawei] controller t1 1/0/0
[Huawei-T1 1/0/0] cable short 133ft
```

5.6.3 channel-set (CT1/PRI interface view)

Function

Using the **channel-set** command, you can bundle timeslots of a CT1/PRI interface to form a channel set.

Using the **undo channel-set** command, you can cancel the configuration.

By default, no timeslot of a CT1/PRI interface is bundled to form a channel set.

Format

channel-set *set-number* **timeslot-list** *list* [**speed** { **56k** | **64k** }]

undo channel-set *set-number*

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
set-number	Specifies the number of the channel set.	The value is an integer that ranges from 0 to 23.
timeslot-list *list*	Specifies the timeslot to be bundled.	*list* specifies the number of a timeslot, and its value ranges from 1 to 24. You can specify a single timeslot by using *number*, specify a timeslot range by using *number1-number2*, or specify multiple timeslots by using *number1,number2-number3*.
speed { **56k** | **64k** }	Specifies the speed of each timeslot, in kbit/s. When **56k** is specified, the speed of a channel set is *n* x 56 kbit/s. When **64k** is specified, the speed of a channel set is *n* x 64 kbit/s. *n* is the number of timeslots in a channel set. By default, the speed of each timeslot in a channel set is 64 kbit/s. **NOTE** The speed of timeslots at both ends must be the same; otherwise, errors will occur in communication.	-

Views

CT1/PRI interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

In a family or a small enterprise, multiple terminals (such as telephones, fax machines, and computers) may share the same T1 link. In this situation, timeslots of the T1 link need to be bundled to form channel sets. Each channel set transmits a type of service. For example, 2 timeslots are used for voice transmission, and 16 timeslots are used for Internet access.

A CT1/PRI interface has 24 timeslots, numbered from 1 to 24. The timeslots can be bundled into multiple channel sets, and each channel set transmits a type of service.

 Copyright © Huawei Technologies Co., Ltd.

The **channel-set** command bundles timeslots of a CT1/PRI interface to form a channel set. After the **channel-set** command is run, a serial interface is created automatically. It has the same logical features as a synchronous serial interface. The number format of a serial interface is "serial *interface-number*.*set-number*". *interface-number* specifies the number of a CT1/PRI interface, and *set-number* specifies the number of a channel set.

Precautions

- The **channel-set** and **pri-set (CT1/PRI interface view)** commands cannot be used on the same CT1/PRI interface. That is, you can configure only one timeslot bundling mode on a CT1/PRI interface.
- Timeslots of a CT1 interface can be bundled to form a maximum of 24 channel sets and a minimum of 1 channel set. That is, a single timeslot can form a channel set, and 24 timeslots can be bundled to form one channel set.

  NOTE

  If you run the **channel-set** command in the same CT1/PRI interface view multiple times, multiple channel sets can be formed by bundling timeslots. One timeslot can be bundled to only one channel set.
- Channel sets on the local and remote CT1/PRI interfaces must contain the same timeslots; otherwise, errors will occur in communication.

Example

Bundle timeslots 1, 10 to 16, and 18 of CT1 1/0/0 to form channel set 0.

```
<Huawei> system-view
[Huawei] controller t1 1/0/0
[Huawei-T1 1/0/0] channel-set 0 timeslot-list 1,10-16,18
```

Related Topics

5.6.15 pri-set (CT1/PRI interface view)

5.6.4 clock (CT1/PRI interface view)

Function

Using the **clock** command, you can set the clock mode for a CT1/PRI interface.

Using the **undo clock** command, you can restore the default setting.

By default, a CT1/PRI interface works in slave clock mode and uses line clock signals.

Format

clock { **master** | **slave** }

undo clock

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
master	Configures a CT1/PRI interface to work in master clock mode and use internal clock signals. When a CT1/PRI interface functions as a Data Circuit-terminating Equipment (DCE), it must work in master clock mode and provide clock signals for a Data Terminal Equipment (DTE).	-
slave	Configures a CT1/PRI interface to work in slave clock mode and use line clock signals. When a CT1/PRI interface functions as a DTE, it must work in slave clock mode and obtain clock signals from a DCE.	-

Views

CT1/PRI interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

To exchange data correctly, communicating parties must work in clock synchronization state.

A CT1/PRI interface supports the following clock modes:

- master: uses the internal clock signal.
- slave: uses the line clock signal.

Precautions

When two routers are directly connected by using two CT1/PRI interfaces, the two CT1/PRI interfaces must work in master clock mode and slave clock mode.

Example

Configure CT1/PRI 1/0/0 to work in master clock mode.

```
<Huawei> system-view
[Huawei] controller t1 1/0/0
[Huawei-T1 1/0/0] clock master
```

5.6.5 controller t1

Function

Using the **controller t1** command, you can enter the view of a CT1/PRI interface.

Copyright © Huawei Technologies Co., Ltd.

Format

controller t1 *interface-number*

Parameters

Parameter	Description	Value
interface-number	Specifies the number of a CT1/PRI interface.	-

Views

System view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

To enter the CT1/PRI interface view, run the **controller t1** command.

Prerequisites

The 1E1T1-M/2E1T1-M interface card is configured to work in CT1/PRI mode, run the **set workmode slot** *slot-id* **e1t1 t1-data**.

Example

Enter the view of CT1/PRI 1/0/0.

```
<Huawei> system-view
[Huawei] controller t1 1/0/0
[Huawei-T1 1/0/0]
```

5.6.6 crc

Function

The **crc** command configures the cyclic redundancy check (CRC) mode of a synchronous serial interface.

The **undo crc** command restores the default CRC mode of a synchronous serial interface.

By default, the 16-bit CRC is used.

Format

crc { **16** | **32** | **none** }

undo crc

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
16	Indicates the 16-bit CRC.	-
32	Indicates the 32-bit CRC.	-
none	Indicates that the synchronous serial interface does not perform CRC.	-

Views

Interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

CRC is a commonly used method to detect transmission errors in a communication system. It checks for transmission errors by adding redundancy codes to the original data. Transmission errors are more likely to be detected when more redundancy codes are added, but data is transmitted at a lower efficiency. Use the 16-bit or 32-bit CRC mode as required.

Precautions

- Interfaces that support CRC include:
  - Synchronous/asynchronous serial interfaces that work in synchronous mode. The interface name is Serial.
  - Interfaces formed by CE1/PRI and CT1/PRI interfaces. The interface name is Serial and the interface logic is the same as that of synchronous serial interfaces.
  - Interfaces formed by CE3 interfaces. The interface name is Serial and the interface logic is the same as that of synchronous serial interfaces.
  - Interfaces formed by E1-F and T1-F interfaces. The interface name is Serial and the interface logic is the same as that of synchronous serial interfaces.
  - Interfaces formed by E1/T1 interfaces that are channelized from CPOS interfaces. The interface name is Serial and the interface logic is the same as that of synchronous serial interfaces.
- The synchronous serial interfaces on both ends of a link must use the CRC of the same length. If lengths of the CRCs used on two ends are different, the two devices cannot communicate with each other.

 Copyright © Huawei Technologies Co., Ltd.

Example

Set the CRC mode to 32-bit CRC on Serial 1/0/0/0:0.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0/0:0
[Huawei-Serial1/0/0/0:0] crc 32
```

5.6.7 data-coding (CT1/PRI interface view)

Function

Using the **data-coding** command, you can determine whether data is inverted by a CT1/PRI interface.

Using the **undo data-coding** command, you can restore the default setting.

By default, a CT1/PRI interface does not invert data.

Format

data-coding { **inverted** | **normal** }

undo data-coding

Parameters

Parameter	Description	Value
inverted	Configures a CT1/PRI interface to invert data.	-
normal	Configures a CT1/PRI interface not to invert data.	-

Views

CT1/PRI interface view

Default Level

2: Configuration level

Usage Guidelines

Two devices can communicate only when the same data inversion configuration is performed on CT1/PRI interfaces on both devices.

Example

Configure CT1/PRI 1/0/0 to invert data.

```
<Huawei> system-view
[Huawei] controller t1 1/0/0
[Huawei-T1 1/0/0] data-coding inverted
```

 Copyright © Huawei Technologies Co., Ltd.

5.6.8 detect-rai (CT1/PRI interface view)

Function

Using the **detect-rai** command, you can enable remote alarm indication (RAI) detection on a CT1/PRI interface.

Using the **undo detect-rai** command, you can disable RAI detection.

By default, RAI detection is enabled on a CT1/PRI interface.

Format

detect-rai

undo detect-rai

Parameters

None

Views

CT1/PRI interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

If RAI detection is enabled, a device sends an RAI alarm to its peer device after detecting loss of frame (LoF) caused by clock asynchronization or loss of signal (LOS).

Prerequisites

The frame format has been set to extended super frame (ESF) by using the **frame-format esf** command.

Example

Disable RAI detection on CT1/PRI 1/0/0.

```
<Huawei> system-view
[Huawei] controller t1 1/0/0
[Huawei-T1 1/0/0] undo detect-rai
```

5.6.9 display controller t1

Function

Using the **display controller t1** command, you can view information about a CT1/PRI interface.

 Copyright © Huawei Technologies Co., Ltd.

Format

display controller [**t1** [*interface-number*]]

Parameters

Parameter	Description	Value
interface-number	Displays information about a specified CT1/PRI interface.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

When monitoring the interface status or locating faults on an interface, run the **display controller t1** command to obtain the configuration information and alarm state of the interface. You can locate faults on the interface according to the command output.

Example

Display information about CT1/PRI 1/0/0.

```
<Huawei> display controller t1 1/0/0
T1 1/0/0 current state : DOWN
Description : HUAWEI, AR Series, T1 1/0/0 Interface
Basic Configuration:
  Work Mode is T1 Framed, Cable type is 100 Ohm balanced.
  Frame-format is ESF, Line Code is B8zs.
  Source Clock is Slave, Data-coding is Normal.
  Idle code is 7E, Itf type is 7E, Itf number is 4.
  Loopback is Not Set.
Alarm State:
  Receiver alarm state is Loss-of-Frame.
  Transmitter is sending remote alarm.
Historical Statistics:
  Data in current interval (0 seconds elapsed):
  0 Line Code Violations, 0 Path Code Violations
  0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
  0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
  Total Data (last 24 hours):
  0 Line Code Violations, 0 Path Code Violations
  0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
  0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Sec
```

 Copyright © Huawei Technologies Co., Ltd.

Table 5-25 Description of the display controller t1 command output

Item	Sub-item	Description
current state	-	Physical status of the interface. • UP: indicates that the interface is physically Up. • DOWN: indicates that the interface is physically Down.
Description	-	Description of the interface.
Basic Configuration	Work Mode is T1 Framed	The interface works in T1 framed mode, namely, the channelized mode.
Basic Configuration	Cable type is 100 Ohm balanced	The cable is connected to a 100 ohm balanced cable.
Basic Configuration	Frame-format	Frame format of the interface, which can be ESF or SF. To configure the frame format for a CT1/PRI interface, run the **frame-format (CT1/PR interface view)** command. • ESF: extended super frame format • SF: super frame format
Basic Configuration	Line Code	Encoding and decoding mode of the interface.
Basic Configuration	Source Clock	Clock mode of the interface, which can be master or slave. To configure the clock mode for a CT1/PRI interface, run the **clock (CT1/PRI interface view)** command. • MASTER: indicates that the interface works in master clock mode and uses the internal clock signal. • SLAVE: indicates that the interface works in slave clock mode and uses the line clock signal.
Basic Configuration	Data-coding	Whether to invert data. The value can be **inverted** or **normal**. To configure a CT1/PRI interface to invert data, run the **data-coding (CT1/PRI interface view)** command. • inverted: indicates that the interface inverts data. • normal: indicates that the interface does not invert data.

Copyright © Huawei Technologies Co., Ltd.

Item	Sub-item	Description
Basic Configuration	Idle code	Line idle code of the interface, which can be 7E or FF. To configure the line idle code for a CT1/PRI interface, run the **idlecode (CT1/PRI interface view)** command.
Basic Configuration	Itf type	Interframe filling tag of the interface, which can be 7E or FF. To configure the interframe filling tag for a CT1/PRI interface, run the **itf (CT1/PRI interface view)** command.
Basic Configuration	Itf number	Number of interframe filling tags, which ranges from 0 to 14. To configure the number of interframe filling tags on a CT1/PRI interface, run the **itf (CT1/PRI interface view)** command.
Basic Configuration	Loopback	Whether loopback detection is enabled on the interface. If loopback detection has been enabled, the loopback detection mode is displayed. To configure loopback detection on a CT1/PRI interface, run the **loopback (CT1/PRI interface view)** command. **NOTE** The loopback detection function detects the interface status or cable status and must be disabled when devices work properly.

Copyright © Huawei Technologies Co., Ltd.

Item	Sub-item	Description
Alarm State	Receiver alarm state is	Type of a received alarm. If no alarm is received, the message "Receiver alarm state is None." is displayed. If an alarm is generated, the specific alarm type is displayed. The following alarms may be generated: ● Loss-of-Signal (LOS): This alarm is generated when data transmission is interrupted or frames are lost because of severe problems, for example, the cable is broken or is not well connected. ● Alarm-Indication-Signal (AIS): This alarm is generated when the remote end fails to receive the frame alignment signals. This alarm generally indicates a fault on the remote device and is also called the upstream alarm. ● Loss-of-Frame (LOF): This alarm is generated when signals cannot be encapsulated in frames. It is usually generated with a LOS alarm and is cleared when frame alignment succeeds. ● Remote-Alarm-Indication (RAI): This alarm is generated when the remote end does not receive frames from the local end for some reasons, for example, the local end fails to send frames, the transmission line of the local end fails, or the remote end fails to receive frames. When a LOS, AIS, or LOF alarm is generated, the local end needs to send the RAI bit to the remote end. In addition, "Transmitter is sending remote alarm." is displayed.
Historical Statistics	Data in current interval	The current accumulation period.
Historical Statistics	Line Code Violations	Count of both Bipolar Violations (BPVs) and Excessive Zeros (EXZs) occurring over the accumulation period.
Historical Statistics	Path Code Violations	Frame synchronization bit error in the E1-noCRC formats or a CRC error in the E1-CRC formats.
Historical Statistics	Slip Secs	A second with one or more out of frame defects or a detected incoming AIS.

Copyright © Huawei Technologies Co., Ltd.

Item	Sub-item	Description
Historical Statistics	Fr Loss Secs	Number of seconds an Out Of Frame (OOF) error is detected.
Historical Statistics	Line Err Secs	A second in which one or more code violations occurred or one or more LOS defects.
Historical Statistics	Degraded Mins	One in which the estimated error rate exceeds 1E-6 but does not exceed 1E-3.
Historical Statistics	Errored Secs	A second with one or more path coding violations, one or more Out of Frame defects, or one or more controlled slip events or a detected AIS defect.
Historical Statistics	Bursty Err Secs	A second with fewer than 320 and more than one path coding violation error events, no Severely Errored Frame defects, and no detected incoming AIS defects.
Historical Statistics	Severely Err Secs	A second with 320 or more path code violation errors events, one or more Out of Frame defects, or a detected AIS defect.
Historical Statistics	Unavail Secs	Number of seconds that the interface is unavailable.
Historical Statistics	Total Data	Displays total accumulated data for all intervals.

5.6.10 display workmode

Function

The **display workmode** command displays the working modes of interface cards.

Format

display workmode { **slot** *slot-id* | **all** }

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
slot *slot-id*	Displays the working mode of an interface card in a specified slot.	The value must be the slot ID of an interface card with a configurable working mode. The working mode of the following interface cards can be changed: 1E1T1-M/2E1T1-M, 1E1T1-F/2E1T1-F, 4G.SHDSL, VDSL2, 1CPOS-155M, 4STM1 and 2BST.
all	Displays the working mode of all interface cards with configurable working modes.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

This command applies to only the interface cards with configurable working mode. To configure the working mode of an interface card, run the **set workmode e1t1**, **set workmode e1t1-f**, **set workmode shdsl**, **set workmode vdsl**, **set workmode cpos**, **set workmode stm** or **set workmode bri** command.

Example

Display the working mode of the interface card in slot 2.

```
<Huawei> display workmode slot 2
-------------------------------------------------------------------------------
Slot  Type              config-workmode     active-workmode
-------------------------------------------------------------------------------
2     1CPOS-155M-W      e1-data             e1-data
```

Table 5-26 Description of the display workmode command output

Item	Description
Slot	Slot ID of the interface card.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Type	Interface card type: • 1E1/T1-M • 2E1/T1-M • 4E1/T1-M • 8E1/T1-M • 1E1/T1-F • 2E1/T1-F • 4E1/T1-F • 8E1/T1-F • 4G.SHDSL • VDSL2 • 1CPOS-155M • 4STM1 • 2BST

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
config-workmode	config working mode: ● e1-data: The interface card works in CE1/PRI mode. ● e1-voice: The interface card is configured as an E1 voice card. ● t1-data: The interface card works in CT1/PRI mode. ● t1-voice: The interface card is configured as an T1 voice card. ● stm1: The interface card works in 4stm mode, that is, it provides four interfaces working at the rate of 155 Mbit/s. ● stm4: The interface card works in 1stm mode, that is, it provides one interface working at the rate of 622 Mbit/s. ● e1-f: The interface card works in E1-F mode. ● t1-f: The interface card works in T1-F mode. ● atm: The 4G.SHDSL interface card works in ATM mode. ● ptm: The 4G.SHDSL interface card works in PTM mode. ● bri-voice-nt: The voice interface card works in NT mode. ● bri-voice-te: The voice interface card works in TE mode.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
active-workmode	active working mode: • e1-data: The interface card works in CE1/PRI mode. • e1-voice: The interface card is configured as an E1 voice card. • t1-data: The interface card works in CT1/PRI mode. • t1-voice: The interface card is configured as an T1 voice card. • stm1: The interface card works in 4stm mode, that is, it provides four interfaces working at the rate of 155 Mbit/s. • stm4: The interface card works in 1stm mode, that is, it provides one interface working at the rate of 622 Mbit/s. • e1-f: The interface card works in E1-F mode. • t1-f: The interface card works in T1-F mode. • atm: The 4G.SHDSL interface card works in ATM mode. • ptm: The 4G.SHDSL interface card works in PTM mode. • bri-voice-nt: The voice interface card works in NT mode. • bri-voice-te: The voice interface card works in TE mode.

5.6.11 frame-format (CT1/PRI interface view)

Function

Using the **frame-format** command, you can set the frame format for a CT1/PRI interface.

Using the **undo frame-format** command, you can restore the default setting.

By default, a CT1/PRI interface uses the extended super frame (ESF) format.

Format

frame-format { **esf** | **sf** }

undo frame-format

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
esf	Sets the frame format to ESF.	-
sf	Sets the frame format to super frame (SF).	-

Views

CT1/PRI interface view

Default Level

2: Configuration level

Usage Guidelines

A CT1/PRI interface supports the SF format and ESF format. The two formats enable multiple frames to share the frame alignment information and signaling information so that more bits can be used to transmit data.

- SF: consists of 12 frames that share the frame alignment information and signaling information. Frame 6 and frame 12 are signaling frames.
- ESF: consists of 24 frames that share the frame alignment information and signaling information. Frames 6, 12, 18, and 24 are signaling frames.

Example

Set the frame format on CT1/PRI 1/0/0 to SF.

```
<Huawei> system-view
[Huawei] controller t1 1/0/0
[Huawei-T1 1/0/0] frame-format sf
```

5.6.12 idlecode (CT1/PRI interface view)

Function

Using the **idlecode** command, you can set the line idle code for a CT1/PRI interface.

Using the **undo idlecode** command, you can restore the default setting.

By default, the line idle code of a CT1/PRI interface is 0x7e.

Format

idlecode { **7e** | **ff** }

undo idlecode

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
7e	Sets the line idle code to 0x7e.	-
ff	Sets the line idle code to 0xff.	-

Views

CT1/PRI interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

A CT1/PRI interface transmits electrical signals, and therefore the interface line keeps transmitting data. When no data is being transmitted, a line idle code needs to be filled.

The line idle code is the code sent over the timeslot that is not bundled to form a logical channel.

A CT1/PRI interface supports two line idle codes: 0x7e and 0xff. The default line idle code 0x7e is recommended.

Precautions

- If you run the **idlecode** command multiple times in the same CT1/PRI interface view, only the latest configuration takes effect.
- Two devices can communicate properly only when the same line idle code is set for CT1/PRI interfaces on both devices.

Example

Set the line idle code to 0xff for CT1/PRI 1/0/0.

```
<Huawei> system-view
[Huawei] controller t1 1/0/0
[Huawei-T1 1/0/0] idlecode ff
```

5.6.13 itf (CT1/PRI interface view)

Function

Using the **itf** command, you can set the interframe filling tag and the number of interframe filling tags on a CT1/PRI interface.

Using the **undo itf** command, you can restore the default setting.

Copyright © Huawei Technologies Co., Ltd.

By default, a CT1/PRI interface uses the interframe filling tag 0x7e and four interframe filling tags.

Format

itf { **number** *number* | **type** { **7e** | **ff** } }

undo itf { **number** | **type** }

Parameters

Parameter	Description	Value
number *number*	Specifies the number of interframe filling tags.	The value is an integer that ranges from 0 to 14.
type	Specifies the interframe filling tag.	-
7e	Sets the interframe filling tag to 0x7e.	-
ff	Sets the interframe filling tag to 0xff.	-

Views

CT1/PRI interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The interframe filling tag is the code sent when the timeslot bundled to form a logical channel does not send any service data.

A CT1/PRI interface supports two interframe filling tags: 0x7e and 0xff. The default interframe filling tag 0x7e is recommended.

Precautions

- Two devices can communicate properly only when the same interframe filling tag and the same number of interframe filling tags are set on CT1/PRI interfaces on both devices.
- A CT1/PRI interface cannot achieve the bandwidth because of extra costs of interframe filling tags. To improve the transmission rate of the CT1/PRI interface, run the **itf number** command to set the number of interframe filling tags to 0.

 Copyright © Huawei Technologies Co., Ltd.

Example

Set the interframe filling tag to 0xff on CT1/PRI 1/0/0.

```
<Huawei> system-view
[Huawei] controller t1 1/0/0
[Huawei-T1 1/0/0] itf type ff
```

5.6.14 loopback (CT1/PRI interface view)

Function

Using the **loopback** command, you can enable loopback detection and set the loopback detection mode on a CT1/PRI interface.

Using the **undo loopback** command, you can restore the default setting.

By default, loopback detection is disabled.

Format

loopback { **local** | **payload** | **remote** }

undo loopback

Parameters

Parameter	Description	Value
local	Sets internal loopback.	-
payload	Sets payload loopback.	-
remote	Sets external loopback.	-

Views

CT1/PRI interface view

Default Level

2: Configuration level

Usage Guidelines

The loopback detection function detects the interface status or cable status and must be disabled when devices work properly.

- In internal loopback mode, the local device loops back outgoing packets to itself to test whether it works properly.
- In payload loopback mode, the local device loops back the valid payload of outgoing packets to itself. Generally, the synchronization signals transmitted by timeslot 0 are not looped back to the local device.

Copyright © Huawei Technologies Co., Ltd.

- In external loopback mode, the local device loops back the packets received from its peer device to the peer device to test whether the link between the two devices works properly.

Example

Enable internal loopback detection on CT1/PRI 1/0/0.

```
<Huawei> system-view
[Huawei] controller t1 1/0/0
[Huawei-T1 1/0/0] loopback local
```

5.6.15 pri-set (CT1/PRI interface view)

Function

Using the **pri-set** command, you can bundle timeslots of a CT1/PRI interface to form a PRI set.

Using the **undo pri-set** command, you can cancel the configuration.

By default, no timeslot of a CT1/PRI interface is bundled to form a PRI set.

Format

pri-set [**timeslot-list** *list*]

undo pri-set

Parameters

Parameter	Description	Value
timeslot-list *list*	Specifies the timeslot to be bundled. If this parameter is not specified, all timeslots except timeslot 0 are bundled to form an ISDN PRI interface at a rate of 23B+D.	*list* specifies the number of a timeslot, and its value ranges from 1 to 24. Timeslot 24 functions as the D channel and must be bundled to other timeslots to form a PRI set. You can specify a single timeslot by using *number*, specify a timeslot range by using *number1-number2*, or specify multiple timeslots by using *number1,number2-number3*.

Views

CT1/PRI interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Copyright © Huawei Technologies Co., Ltd.

To use a CT1/PRI interface to transmit voice service data and ISDN signals, run the **pri-set** command to bundle timeslots of the CT1/PRI interface to form a PRI interface.

When a CT1/PRI interface works as a PRI interface, timeslot 24 functions as the D channel to transmit signals. You can bundle any of timeslots 1 to 23 with timeslot 24 to form a PRI set. The PRI set contains *n* B channels and one D channel. Here, *n* is the number of timeslots in the PRI set except timeslot 24.

After the **pri-set** command is run, a serial interface is created automatically. It has the same logical features as an ISDN PRI interface. The number format of a serial interface is "serial *interface-number*:15". *interface-number* specifies the number of a CT1/PRI interface.

Precautions

- The **pri-set** and **channel-set** commands cannot be used on the same CT1/PRI interface. That is, you can configure only one timeslot bundling mode on a CT1/PRI interface.
- Before running the **undo pri-set** command, run the **shutdown** command to disable the specified serial interface.
- Channel sets on the local and remote CT1/PRI interfaces must contain the same timeslots; otherwise, errors will occur in communication.

Example

Bundle timeslots 1, 5 to 8, and 24 of CT1/PRI 1/0/0 to form a PRI set.

```
<Huawei> system-view
[Huawei] controller t1 1/0/0
[Huawei-T1 1/0/0] pri-set timeslot-list 1,5-8,24
```

Related Topics

5.6.3 channel-set (CT1/PRI interface view)

5.6.16 set workmode e1t1

Function

The **set workmode e1t1** command sets the working mode of a 1E1T1-M/2E1T1-M interface card.

By default, a 1E1T1-M/2E1T1-M interface card works in CE1/PRI mode (e1-data).

NOTE

The 4E1T1-M/8E1T1-M interface card only works in CE1/PRI mode (e1-data) and does not support working mode switching.

Format

set workmode slot *slot-id* **e1t1** { **e1-data** | **t1-data** | **e1-voice** | **t1-voice** }

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
slot *slot-id*	Specifies the slot ID of a 1E1T1-M/2E1T1-M interface card.	Run the **display device** command to view slot IDs and types of interface cards and find the slot ID with E1/T1-M displayed. Then run the **display workmode** command to view the interface card work mode on the device.
e1-data	Indicates a 1E1T1-M/2E1T1-M interface card works in CE1/PRI mode and functions as an E1 data card.	-
t1-data	Indicates a 1E1T1-M/2E1T1-M interface card works in CT1/PRI mode and functions as a T1 data card.	-
e1-voice	Indicates a 1E1T1-M/2E1T1-M interface card functions as a E1 voice card.	-
t1-voice	Indicates a 1E1T1-M/2E1T1-M interface card functions as a T1 voice card.	-

Views

System view

Default Level

3: Management level

Usage Guidelines

Usage Scenario

A 1E1T1-M interface card provides one E1/T1/PRI/VE1/VT1 interface and a 2E1T1-M interface card provides two E1/T1/PRI/VE1/VT1interfaces. The **set workmode e1t1** command sets the working mode of a 1E1T1-M/2E1T1-M interface card.

Precautions

After this command is used, the system prompts you to reset the 1E1T1-M/2E1T1-M interface card to make the new working mode take effect. If you select **Yes**, the system resets the interface card. Otherwise, you need to run the **reset slot** command to manually reset the interface card to make the new working mode take effect.

 Copyright © Huawei Technologies Co., Ltd.

Example

Configure the 2E1T1-M interface card in slot 1 to functions as a T1 data card.

```
<Huawei> system-view
[Huawei] set workmode slot 1 e1t1 t1-data
Warning: Changing the working mode will reset the board in slot 1. Continue? [y/
n]:y
INFO: Resetting board[1] succeeded.
```

Configure the 2E1T1-M interface card in slot 1 to functions as an E1 voice card.

```
<Huawei> system-view
[Huawei] set workmode slot 1 e1t1 e1-voice
Warning: Changing the working mode will reset the board in slot 1. Continue? [y/
n]:y
INFO: Resetting board[1] succeeded.
```

Related Topics

4.1.3 display device

5.6.10 display workmode

4.2.13 reset slot

5.7 CE3 Interface Configuration Commands

5.7.1 clock (CE3 interface view)

Function

The **clock** command sets the clock mode of a CE3 interface.

The **undo clock** command restores the default settings.

By default, a CE3 interface works in slave clock mode.

Format

clock { **master** | **slave** }

undo clock

Parameters

Parameter	Description	Value
master	Configures a CE3 interface to work in master clock mode. When the device functions as a Data Circuit-terminating Equipment (DCE), the CE3 interface of the device must work in master clock mode and provide clock signals for a Data Terminal Equipment (DTE).	-

 Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
slave	Configures a CE3 interface to work in slave clock mode. When the device functions as a DTE, the CE3 interface of the device must work in slave clock mode and obtain clock signals from a DCE.	-

Views

CE3 interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

To exchange data successfully, communicating parties must work in clock synchronization state.

Precautions

When two routers are directly connected using two CE3 interfaces, one CE3 interface must work in master clock mode and the other must work in slave clock mode.

Example

Configure CE3 1/0/0 to work in master clock mode.

```
<Huawei> system-view
[Huawei] controller e3 1/0/0
[Huawei-E3 1/0/0] clock master
```

5.7.2 controller e3

Function

The **controller e3** command enters the CE3 interface view.

Format

controller e3 *interface-number*

Parameters

Parameter	Description	Value
interface-number	Specifies the number of a CE3 interface.	-

Copyright © Huawei Technologies Co., Ltd.

Views

System view

Default Level

2: Configuration level

Usage Guidelines

To enter the CE3 interface view, run the **controller e3** command.

Example

Enter the view of CE3 1/0/0.

```
<Huawei> system-view
[Huawei] controller e3 1/0/0
[Huawei-E3 1/0/0]
```

5.7.3 crc

Function

The **crc** command configures the cyclic redundancy check (CRC) mode of a synchronous serial interface.

The **undo crc** command restores the default CRC mode of a synchronous serial interface.

By default, the 16-bit CRC is used.

Format

crc { **16** | **32** | **none** }

undo crc

Parameters

Parameter	Description	Value
16	Indicates the 16-bit CRC.	-
32	Indicates the 32-bit CRC.	-
none	Indicates that the synchronous serial interface does not perform CRC.	-

Views

Interface view

 Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

CRC is a commonly used method to detect transmission errors in a communication system. It checks for transmission errors by adding redundancy codes to the original data. Transmission errors are more likely to be detected when more redundancy codes are added, but data is transmitted at a lower efficiency. Use the 16-bit or 32-bit CRC mode as required.

Precautions

- Interfaces that support CRC include:
  - Synchronous/asynchronous serial interfaces that work in synchronous mode. The interface name is Serial.
  - Interfaces formed by CE1/PRI and CT1/PRI interfaces. The interface name is Serial and the interface logic is the same as that of synchronous serial interfaces.
  - Interfaces formed by CE3 interfaces. The interface name is Serial and the interface logic is the same as that of synchronous serial interfaces.
  - Interfaces formed by E1-F and T1-F interfaces. The interface name is Serial and the interface logic is the same as that of synchronous serial interfaces.
  - Interfaces formed by E1/T1 interfaces that are channelized from CPOS interfaces. The interface name is Serial and the interface logic is the same as that of synchronous serial interfaces.
- The synchronous serial interfaces on both ends of a link must use the CRC of the same length. If lengths of the CRCs used on two ends are different, the two devices cannot communicate with each other.

Example

Set the CRC mode to 32-bit CRC on Serial 1/0/0/0:0.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0/0:0
[Huawei-Serial1/0/0/0:0] crc 32
```

5.7.4 display controller e3

Function

The **display controller e3** command displays information about a CE3 interface.

Format

display controller [**e3** [*interface-number*]]

 Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
interface-number	Specifies a CE3 interface.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

To monitor the status or locate faults on a CE3 interface, run the **display controller e3** command to view the interface configuration and alarm information. You can locate faults on the interface according to the command output.

Example

Display information about CE3 1/0/0.

```
<Huawei> display controller e3 1/0/0
E3 1/0/0 current state : UP
Description : HUAWEI, AR Series, E3 1/0/0 Interface
  Frame-format G751, line code HDB3, clock slave, national-bit 1, loopback not set
  Receiver alarm state is None.
```

Table 5-27 Description of the display controller e3 command output

Item	Description
E3 1/0/0 current state	Current physical status of the CE3 interface: • UP: The physical status is normal. • DOWN: The physical status is abnormal.
Description	Description of the CE3 interface. The value is a maximum of 242 case-sensitive characters with spaces. The description helps users learn about the functions of the CE3 interface.
Frame-format	Frame format of the CE3 interface.
line code	Line coding and decoding format of the CE3 interface.
clock	Clock mode: • slave • master
national-bit	National bit.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
loopback not set	The loopback function is disabled on the CE3 interface. The loopback function is enabled on the CE3 interface only when some special functions are tested.
Receiver alarm state is None	No alarm is received. If an alarm is generated, the specific alarm type is displayed. The following alarms may be generated: • Loss-of-Signal (LOS): This alarm is generated when data transmission is interrupted or frames are lost because of severe problems, for example, the cable is broken or is not well connected. • Alarm-Indication-Signal (AIS): This alarm is generated when the remote device fails to receive frame alignment signals. This alarm generally indicates a fault on the remote device and is also called the upstream alarm. • Loss-of-Frame (LOF): This alarm is generated when signals cannot be encapsulated in frames. It is usually generated with a LOS alarm and is cleared when frame alignment succeeds. • Remote-Alarm-Indication (RAI): This alarm is generated when the remote device does not receive frames from the local device for some reasons, for example, the local device fails to send frames, the transmission line of the local device fails, or the remote device fails to receive frames.

5.7.5 fe3

Function

The **fe3** command configures a CE3 interface to work in Fractional E3 (FE3) mode and sets the DSU mode or subrate.

The **undo fe3** command restores the default settings.

By default, the DSU mode is 1, that is, Kentrox mode. The default subrate is 34010 kbit/s.

Format

fe3 { **dsu-mode** { **0** | **1** } | **subrate** *number* }

undo fe3 { **dsu-mode** | **subrate** }

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
dsu-mode	Specifies the DSU mode for FE3.	-
0	Sets the DSU mode to 0, that is, Digital Link mode. In this mode, a CE3 interface supports a subrate that ranges from 358 kbit/s to 34010 kbit/s. There are 95 rate levels with the differential 358 kbit/s between each two rate levels.	-
1	Sets the DSU mode to 1, that is, Kentrox mode. In this mode, a CE3 interface supports a subrate of 34010 kbit/s or a subrate that ranges from 500 kbit/s to 24500 kbit/s. There are 50 rate levels with the differential 500 kbit/s between each two rate levels.	-
subrate *number*	Specifies the subrate of the CE3 interface in FE3 mode.	The value is an integer that ranges from 1 to 34010, in kbit/s.

Views

CE3 interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

FE3, Fractional E3 or Subrate E3, is an E3 non-standard application mode. Devices of other vendors support different rate levels. You can run the **fe3** command to configure Huawei devices to be compatible with FE3 DSU modes on devices of other vendors so that Huawei devices can communicate with devices of other vendors.

Precautions

The rate set using the **fe3 subrate** command is an approximate rate. Subrates of each DSU mode that is set using the **fe3 dsu-mode** command are dispersed. Therefore, after a subrate is specified using the **fe3 subrate** command, a CE3 interface calculates the most accurate rate (in bit/s) matching the specified subrate based on the current DSU mode and enables the hardware circuit to support the calculated rate.

 Copyright © Huawei Technologies Co., Ltd.

Example

Configure CE3 1/0/0 to work in FE3 mode, set the DSU mode to 1, and set the subrate to 3000 kbit/s

```
<Huawei> system-view
[Huawei] controller e3 1/0/0
[Huawei-E3 1/0/0] using e3
[Huawei-E3 1/0/0] fe3 dsu-mode 1
[Huawei-E3 1/0/0] fe3 subrate 3000
```

Related Topics

5.7.4 display controller e3

5.7.6 itf (CE3 interface view)

Function

The **itf** command sets the interframe filling tag and the number of interframe filling tags on a CE3 interface.

The **undo itf** command restores the default setting.

By default, a CE3 interface uses the interframe filling tag 0x7e and four interframe filling tags.

Format

itf { **number** *number* | **type** { **7e** | **ff** } }

undo itf { **number** | **type** }

Parameters

Parameter	Description	Value
number *number*	Specifies the number of interframe filling tags.	The value is an integer that ranges from 0 to 14.
type	Specifies the interframe filling tag.	-
7e	Sets the interframe filling tag to 0x7e.	-
ff	Sets the interframe filling tag to 0xff.	-

Views

CE3 interface view

Default Level

2: Configuration level

Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

Usage Scenario

The interframe filling tag is the code sent when the timeslot bundled to form a logical channel does not send any service data.

A CE3 interface supports two interframe filling tags: 0x7e and 0xff. The default interframe filling tag 0x7e is recommended.

Precautions

- Two devices can communicate properly only when the same interframe filling tag and the same number of interframe filling tags are set on CE3 interfaces on both devices.
- A CE3 interface cannot achieve the bandwidth because of extra costs of interframe filling tags. To improve the transmission rate of the CE3 interface, run the **itf number** command to set the number of interframe filling tags to 0.

Example

Set the interframe filling tag to 0xff on CE3 1/0/0.

```
<Huawei> system-view
[Huawei] controller e3 1/0/0
[Huawei-E3 1/0/0] itf type ff
```

5.7.7 loopback (CE3 interface view)

Function

The **loopback** command enables loopback detection and sets the loopback detection mode on a CE3 interface.

The **undo loopback** command restores the default settings.

By default, loopback detection is disabled.

Format

loopback { **local** | **remote** }

undo loopback

Parameters

Parameter	Description	Value
local	Sets internal loopback detection.	-
remote	Sets external loopback detection.	-

 Copyright © Huawei Technologies Co., Ltd.

Views

CE3 interface view

Default Level

2: Configuration level

Usage Guidelines

The loopback detection function monitors the interface status or cable status and must be disabled when devices are working properly.

- In internal loopback mode, the local device loops back outgoing packets to itself to test whether it works properly.
- In external loopback mode, the local device loops back the packets received from the remote device to the remote device to test whether the link between the two devices works properly.

Example

Enable internal loopback detection on CE3 1/0/0.

```
<Huawei> system-view
[Huawei] controller e3 1/0/0
[Huawei-E3 1/0/0] loopback local
```

5.7.8 national-bit (CE3 interface view)

Function

The **national-bit** command sets the national bit on a CE3 interface.

The **undo national-bit** command restores the default settings.

By default, the national bit is 1 on a CE3 interface.

Format

national-bit { **0** | **1** }

undo national-bit

Parameters

Parameter	Description	Value
0	Sets the national bit to 0. This interface can only be used in communication within a country.	-
1	Sets the national bit to 1. This interface can be used in international communication.	-

Views

CE3 interface view

 Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

You are advised to set the national bit to 1. The national bit is set to 0 on a CE3 interface only in some special situations.

Example

Set the national bit on CE3 1/0/0 to 0.

```
<Huawei> system-view
[Huawei] controller e3 1/0/0
[Huawei-E3 1/0/0] national-bit 0
```

Related Topics

5.7.4 display controller e3

5.7.9 using (CE3 interface view)

Function

The **using** command configures a CE3 interface to work in E3 mode.

The **undo using** command disables a CE3 interface from working in E3 mode.

Format

using e3

undo using

Parameters

Parameter	Description	Value
e3	Configures a CE3 interface to work in E3 mode.	-

Views

CE3 interface view

Default Level

2: Configuration level

Usage Guidelines

A CE3 interface is a physical interface in the E3 system, which can work in E3 mode (unchannelized mode). To use an E3 leased line (with 34 Mbit/s bandwidth) to transmit data, configure a CE3 interface to work in E3 mode.

 Copyright © Huawei Technologies Co., Ltd.

- In E3 mode, a CE3 interface works at a rate of 34.368 Mbit/s without timeslot division. Similar to a synchronous serial interface, a CE3 interface supports IP network protocol and data link layer protocols such as PPP and FR.

Example

Configure CE3 1/0/0 to work in E3 mode.

```
<Huawei> system-view
[Huawei] controller e3 1/0/0
[Huawei-E3 1/0/0] using e3
```

5.8 E1-F Interface Configuration Commands

5.8.1 crc

Function

The **crc** command configures the cyclic redundancy check (CRC) mode of a synchronous serial interface.

The **undo crc** command restores the default CRC mode of a synchronous serial interface.

By default, the 16-bit CRC is used.

Format

crc { **16** | **32** | **none** }

undo crc

Parameters

Parameter	Description	Value
16	Indicates the 16-bit CRC.	-
32	Indicates the 32-bit CRC.	-
none	Indicates that the synchronous serial interface does not perform CRC.	-

Views

Interface view

Default Level

2: Configuration level

Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

Usage Scenario

CRC is a commonly used method to detect transmission errors in a communication system. It checks for transmission errors by adding redundancy codes to the original data. Transmission errors are more likely to be detected when more redundancy codes are added, but data is transmitted at a lower efficiency. Use the 16-bit or 32-bit CRC mode as required.

Precautions

- Interfaces that support CRC include:
  - Synchronous/asynchronous serial interfaces that work in synchronous mode. The interface name is Serial.
  - Interfaces formed by CE1/PRI and CT1/PRI interfaces. The interface name is Serial and the interface logic is the same as that of synchronous serial interfaces.
  - Interfaces formed by CE3 interfaces. The interface name is Serial and the interface logic is the same as that of synchronous serial interfaces.
  - Interfaces formed by E1-F and T1-F interfaces. The interface name is Serial and the interface logic is the same as that of synchronous serial interfaces.
  - Interfaces formed by E1/T1 interfaces that are channelized from CPOS interfaces. The interface name is Serial and the interface logic is the same as that of synchronous serial interfaces.
- The synchronous serial interfaces on both ends of a link must use the CRC of the same length. If lengths of the CRCs used on two ends are different, the two devices cannot communicate with each other.

Example

Set the CRC mode to 32-bit CRC on Serial 1/0/0/0:0.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0/0:0
[Huawei-Serial1/0/0/0:0] crc 32
```

5.8.2 display fe1

Function

Using the **display fe1** command, you can view the configuration and alarm information about a specified E1-F interface.

Format

display fe1 serial *interface-number*

Copyright © Huawei Technologies Co., Ltd.

Parameters

Item	Description	Value
serial *interface-number*	Displays the configuration and alarm information about a specified E1-F interface.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

E1-F interfaces on both ends can communicate only when they have the same parameter settings except for the clock mode.

The **display fe1** command displays the E1-F interface configuration. If the local E1-F interface configuration is different from the remote E1-F interface configuration, modify relevant parameters. This command also displays the E1-F interface alarm information, which helps you check whether the link is working properly.

NOTE

This command is applicable only to E1-F interfaces.

Example

Display the configuration and alarm information about E1-F 1/0/0.

```
<Huawei> display fe1 serial 1/0/0
Serial1/0/0
Basic Configuration:
  Work Mode is E1 Fractional Framed, Cable type is 120 Ohm balanced.
  Frame-format is NO-CRC4, Line Code is Hdb3.
  Source Clock is Slave, Data-coding is Normal.
  Idle code is 7E, Itf type is 7E, Itf number is 4.
  Loopback is Not Set.
Alarm State:
  Receiver alarm state is None.
Historical Statistics:
  Data in current interval (0 seconds elapsed):
  0 Line Code Violations, 0 Path Code Violations
  0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
  0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
  Total Data (last 24 hours):
  5604553200 Line Code Violations, 0 Path Code Violations
  85520 Slip Secs, 85520 Fr Loss Secs, 85520 Line Err Secs, 0 Degraded Mins
  85520 Errored Secs, 0 Bursty Err Secs, 85520 Severely Err Secs, 85520 Unavail
Secs
```


Copyright © Huawei Technologies Co., Ltd.

Table 5-28 Description of the display fe1 serial command output

Item	Sub-item	Description
Basic Configuration	Work Mode	Working mode of an E1-F interface: • E1 FRACTIONAL FRAMED: The interface works in framed mode. • E1 UNFRAMED: The interface works in unframed mode. To set the working mode for an E1-F interface, run the **fe1 unframed** command.
Basic Configuration	Cable type	Type of the cable connected to an E1-F interface: • 120 Ohm: balanced cable (twisted pair). • 75 Ohm: non-balanced cable (coaxial cable).
Basic Configuration	Frame-format	Frame format of an E1-F interface, which can be **CRC4** or **NO-CRC4**. To configure the frame format for an E1-F interface, run the **fe1 frame-format** command. • CRC4: multiframe format. • NO-CRC4: basic frame format, which is also called dual-frame format or odd-even frame format.
Basic Configuration	Line Code	Line code used by an E1-F interface. The value is **HDB3**.
Basic Configuration	Source Clock	Clock mode of an E1-F interface, which can be master, slave, or system. To set the clock mode for an E1-F interface, run the **fe1 clock** command. • MASTER: The interface works in master clock mode and uses the local clock. • SLAVE: The interface works in slave clock mode and uses the line clock. • SYSTEM: The interface works in system clock mode and uses the line clock.
Basic Configuration	Data-coding	Whether to invert data: • inverted: The interface inverts data. • normal: The interface does not invert data. To configure data inversion, run the **fe1 data-coding** command.
Basic Configuration	Idle code	Line idle code used by an E1-F interface, which can be 7E or FF. To set the line idle code for an E1-F interface, run the **fe1 idlecode** command.

 Copyright © Huawei Technologies Co., Ltd.

Item	Sub-item	Description
Basic Configuration	Itf type	Interframe filling tag used by an E1-F interface, which can be 7E or FF. To set the minimum number of interframe filling tags for an E1-F interface, run the **fe1 itf** command.
Basic Configuration	Itf number	Minimum number of interframe filling tags, which ranges from 0 to 14. To set the minimum number of interframe filling tags for an E1-F interface, run the **fe1 itf** command.
Basic Configuration	Loopback	Whether loopback detection is enabled on an E1-F interface. If loopback detection has been enabled, the loopback detection mode is displayed. To enable loopback detection on an E1-F interface, run the **fe1 loopback** command. **NOTE** The loopback detection function monitors the interface status or cable status and must be disabled when devices are working properly.
Alarm State	Receiver alarm state is None.	No alarm is received. If an alarm is generated, the specific alarm type is displayed. The following alarms may be generated: • Loss-of-Signal (LoS): This alarm is generated when data transmission is interrupted or frames are lost because of severe problems, for example, the cable is broken or is not connected properly. • Alarm-Indication-Signal (AIS): This alarm is generated when the remote end fails to receive frame alignment signals. This alarm generally indicates a fault on the remote device and is also called the upstream alarm. • Loss-of-Frame (LoF): This alarm is generated when signals cannot be encapsulated in frames. It is generated with a LoS alarm and is cleared when frame alignment succeeds. • Remote-Alarm-Indication (RAI): This alarm is generated when the remote end does not receive frames from the local end for some reasons, for example, the local end fails to send frames, the transmission line of the local end fails, or the remote end fails to receive frames. When a LoS, AIS, or LoF alarm is generated, the local end needs to send the RAI bit to the remote end. This field will be displayed as "Transmitter is sending remote alarm."

Copyright © Huawei Technologies Co., Ltd.

Item	Sub-item	Description
Historical Statistics	Data in current interval	The current accumulation period.
Historical Statistics	Line Code Violations	Count of both Bipolar Violations (BPVs) and Excessive Zeros (EXZs) occurring over the accumulation period.
Historical Statistics	Path Code Violations	Frame synchronization bit error in the E1-noCRC formats or a CRC error in the E1-CRC formats.
Historical Statistics	Slip Secs	A second with one or more out of frame defects or a detected incoming AIS.
Historical Statistics	Fr Loss Secs	Number of seconds an Out Of Frame (OOF) error is detected.
Historical Statistics	Line Err Secs	A second in which one or more code violations occurred or one or more LOS defects.
Historical Statistics	Degraded Mins	One in which the estimated error rate exceeds 1E-6 but does not exceed 1E-3.
Historical Statistics	Errored Secs	A second with one or more path coding violations, one or more Out of Frame defects, or one or more controlled slip events or a detected AIS defect.
Historical Statistics	Bursty Err Secs	A second with fewer than 320 and more than one path coding violation error events, no Severely Errored Frame defects, and no detected incoming AIS defects.
Historical Statistics	Severely Err Secs	A second with 320 or more path code violation errors events, one or more Out of Frame defects, or a detected AIS defect.
Historical Statistics	Unavail Secs	Number of seconds that the interface is unavailable.
Historical Statistics	Total Data	Displays total accumulated data for all intervals.

5.8.3 display workmode

Function

The **display workmode** command displays the working modes of interface cards.

Copyright © Huawei Technologies Co., Ltd.

Format

display workmode { **slot** *slot-id* | **all** }

Parameters

Parameter	Description	Value
slot *slot-id*	Displays the working mode of an interface card in a specified slot.	The value must be the slot ID of an interface card with a configurable working mode. The working mode of the following interface cards can be changed: 1E1T1-M/2E1T1-M, 1E1T1-F/2E1T1-F, 4G.SHDSL, VDSL2, 1CPOS-155M, 4STM1 and 2BST.
all	Displays the working mode of all interface cards with configurable working modes.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

This command applies to only the interface cards with configurable working mode. To configure the working mode of an interface card, run the **set workmode e1t1**, **set workmode e1t1-f**, **set workmode shdsl**, **set workmode vdsl**, **set workmode cpos**, **set workmode stm** or **set workmode bri** command.

Example

Display the working mode of the interface card in slot 2.

```
<Huawei> display workmode slot 2
-------------------------------------------------------------------------
Slot  Type              config-workmode     active-workmode
-------------------------------------------------------------------------
2     1CPOS-155M-W      e1-data             e1-data
```

 Copyright © Huawei Technologies Co., Ltd.

Table 5-29 Description of the display workmode command output

Item	Description
Slot	Slot ID of the interface card.
Type	Interface card type: • 1E1/T1-M • 2E1/T1-M • 4E1/T1-M • 8E1/T1-M • 1E1/T1-F • 2E1/T1-F • 4E1/T1-F • 8E1/T1-F • 4G.SHDSL • VDSL2 • 1CPOS-155M • 4STM1 • 2BST

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
config-workmode	config working mode: ● e1-data: The interface card works in CE1/PRI mode. ● e1-voice: The interface card is configured as an E1 voice card. ● t1-data: The interface card works in CT1/PRI mode. ● t1-voice: The interface card is configured as an T1 voice card. ● stm1: The interface card works in 4stm mode, that is, it provides four interfaces working at the rate of 155 Mbit/s. ● stm4: The interface card works in 1stm mode, that is, it provides one interface working at the rate of 622 Mbit/s. ● e1-f: The interface card works in E1-F mode. ● t1-f: The interface card works in T1-F mode. ● atm: The 4G.SHDSL interface card works in ATM mode. ● ptm: The 4G.SHDSL interface card works in PTM mode. ● bri-voice-nt: The voice interface card works in NT mode. ● bri-voice-te: The voice interface card works in TE mode.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
active-workmode	active working mode: • e1-data: The interface card works in CE1/PRI mode. • e1-voice: The interface card is configured as an E1 voice card. • t1-data: The interface card works in CT1/PRI mode. • t1-voice: The interface card is configured as an T1 voice card. • stm1: The interface card works in 4stm mode, that is, it provides four interfaces working at the rate of 155 Mbit/s. • stm4: The interface card works in 1stm mode, that is, it provides one interface working at the rate of 622 Mbit/s. • e1-f: The interface card works in E1-F mode. • t1-f: The interface card works in T1-F mode. • atm: The 4G.SHDSL interface card works in ATM mode. • ptm: The 4G.SHDSL interface card works in PTM mode. • bri-voice-nt: The voice interface card works in NT mode. • bri-voice-te: The voice interface card works in TE mode.

5.8.4 fe1 clock

Function

Using the **fe1 clock** command, you can set the clock mode of an E1-F interface.

Using the **undo fe1 clock** command, you can restore the default clock mode of an E1-F interface.

By default, an E1-F interface works in slave clock mode and uses the line clock.

Format

fe1 clock { **master** | **slave** | **system** }

undo fe1 clock

 Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
master	Configures an E1-F interface to work in master clock mode and use the local clock. When an E1-F interface functions as the data circuit-terminating equipment (DCE), it must work in master clock mode and provide clock signals for the data terminal equipment (DTE).	-
slave	Configures an E1-F interface to work in slave clock mode and use the line clock. When an E1-F interface functions as the DTE, it must work in slave clock mode and obtain clock signals from the DCE.	-
system	Configures an E1-F interface to work in system clock mode and use the line clock.	-

Views

E1-F interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

To exchange data successfully, communicating parties must work in clock synchronization state.

Precautions

When E1-F interfaces of two devices are directly connected, one E1-F interface must work in master clock mode and the other must work slave clock mode.

Example

Configure E1-F 1/0/0 to work in master clock mode.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] fe1 clock master
```

5.8.5 fe1 data-coding

Function

Using the **fe1 data-coding** command, you can determine whether an E1-F interface inverts data.

Using the **undo fe1 data-coding** command, you can restore the default setting.

Copyright © Huawei Technologies Co., Ltd.

By default, an E1-F interface does not invert data.

Format

fe1 data-coding { **inverted** | **normal** }

undo fe1 data-coding

Parameters

Parameter	Description	Value
inverted	Configures an E1-F interface to invert data.	-
normal	Configures an E1-F interface not to invert data.	-

Views

E1-F interface view

Default Level

2: Configuration level

Usage Guidelines

When data inversion is enabled on an E1-F interface, the E1-F interface inverts every one bit in a data stream into a zero bit and every zero bit into a one bit.

E1-F interfaces on both ends can communicate only when they have the same data inversion configuration.

Example

Configure E1-F 1/0/0 to invert data.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] fe1 data-coding inverted
```

5.8.6 fe1 detect-ais

Function

Using the **fe1 detect-ais** command, you can enable alarm indication signal (AIS) detection on an E1-F interface.

Using the **undo fe1 detect-ais** command, you can disable AIS detection.

By default, AIS detection is enabled on an E1-F interface.

Format

fe1 detect-ais

 Copyright © Huawei Technologies Co., Ltd.

undo fe1 detect-ais

Parameters

None

Views

E1-F interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

AIS alarms are also called upstream alarms, indicating that the peer device or the receive link of the local device becomes faulty.

An AIS alarm is generated when the number of 0s in 512 consecutive bits (two consecutive frames) of a received signal is smaller than 3. An AIS alarm is cleared when the number of 0s in 512 consecutive bits of a received signal is greater than or equal to 3.

When AIS detection is enabled on an E1-F interface, the local device sends the RAI bit to the peer device after detecting AIS alarms.

Prerequisite

The E1-F interface has been configured to work in unframed mode using the **fe1 unframed** command.

Precautions

In framed mode, AIS detection is enabled for frame alignment detection by default. Therefore, this command cannot be used on an E1-F interface working in framed mode.

Example

Disable AIS detection on E1-F 1/0/0.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] undo fe1 detect-ais
```

Related Topics

5.8.15 fe1 unframed

Copyright © Huawei Technologies Co., Ltd.

5.8.7 fe1 detect-rai

Function

Using the **fe1 detect-rai** command, you can enable remote alarm indication (RAI) detection on an E1-F interface.

Using the **undo fe1 detect-rai** command, you can disable RAI detection.

By default, RAI detection is enabled on an E1-F interface.

Format

fe1 detect-rai

undo fe1 detect-rai

Parameters

None

Views

E1-F interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

If RAI detection is enabled, a device sends an RAI alarm to its peer device after detecting loss of frame (LoF) caused by clock asynchronization or loss of signal (LoS).

Prerequisite

The E1-F interface must work in framed mode.

If an E1-F interface works in unframed mode, run the **undo fe1 unframed** command to configure the E1-F interface to work in framed mode. To view the working mode of an E1-F interface, run the **display fe1** command.

Example

Disable RAI detection on E1-F 1/0/0.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] undo fe1 detect-rai
```

Related Topics

5.8.2 display fe1

Copyright © Huawei Technologies Co., Ltd.

5.8.15 fe1 unframed

5.8.8 fe1 frame-format

Function

Using the **fe1 frame-format** command, you can set the frame format for an E1-F interface.

Using the **undo fe1 frame-format** command, you can restore the default frame format.

By default, an E1-F interface uses the basic frame format (non-CRC4).

Format

fe1 frame-format { **crc4** | **no-crc4** }

undo fe1 frame-format

Parameters

Parameter	Description	Value
crc4	Sets the frame format to CRC4 (multiframe format).	-
no-crc4	Sets the frame format to non-CRC4 (basic frame format).	-

Views

E1-F interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

In framed mode, an E1-F interface supports two frame formats:

- CRC4: indicates the multiframe format. A multiframe is formed by the first bit in each frame transmitted over timeslot 0. It contains 16 consecutive pulse code modulation (PCM) frames.
- Non-CRC4: indicates the basic frame format, which is also called the dual-frame format or odd-even frame format.

The multiframe format supports Cyclic Redundancy Check 4-bit (CRC4), whereas the basic frame format does not support CRC4.

Prerequisite

The E1-F interface must work in framed mode.

 Copyright © Huawei Technologies Co., Ltd.

If an E1-F interface works in unframed mode, run the **undo fe1 unframed** command to configure the E1-F interface to work in framed mode. To view the working mode of an E1-F interface, run the **display fe1** command.

Precautions

Interfaces on both ends can communicate only when they use the same frame format. If two E1-F interfaces use different frame formats, a CRC4 alarm is generated.

Example

Set the frame format to CRC4 for E1-F 1/0/0.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] fe1 frame-format crc4
```

Related Topics

5.8.2 display fe1

5.8.15 fe1 unframed

5.8.9 fe1 idlecode

Function

Using the **fe1 idlecode** command, you can set the line idle code for an E1 interface.

Using the **undo fe1 idlecode** command, you can restore the default line idle code.

By default, an E1-F interface uses the line idle code 0x7e.

Format

fe1 idlecode { **7e** | **ff** }

undo fe1 idlecode

Parameters

Parameter	Description	Value
7e	Sets the line idle code to 0x7e.	-
ff	Sets the line idle code to 0xff.	-

Views

E1-F interface view

Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

An E1-F interface transmits electrical signals, and therefore the interface line keeps transmitting data. When no data is being transmitted, the line idle code needs to be filled.

The line idle code is the code sent over a timeslot that is not bundled into a channel.

An E1-F interface supports two types of line idle codes: 0x7e and 0xff. The default line idle code 0x7e is recommended.

Precautions

Interfaces on both ends can communicate only when they use the same line idle code.

Example

Set the line idle code to 0xff for E1-F 1/0/0.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] fe1 idlecode ff
```

5.8.10 fe1 itf

Function

Using the **fe1 itf** command, you can set the interframe filling tag and the number of interframe filling tags on an E1-F interface.

Using the **undo fe1 itf** command, you can restore the default setting.

By default, an E1-F interface uses the interframe filling tag 0x7e and sends four filling tags between two frames.

Format

fe1 itf { **number** *number* | **type** { **7e** | **ff** } }

undo fe1 itf { **number** | **type** }

 Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
number *number*	Specifies the number of interframe filling tags.	The value ranges from 0 to 14. Specially, the value ranges from 0 to 7 for the E1-F interface on the AR2204-FE.
type	Specifies the interframe filling tag.	-
7e	Sets the interframe filling tag to 0x7e.	-
ff	Sets the interframe filling tag to 0xff.	-

Views

E1-F interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The interframe filling tag is the code sent when a timeslot in a logical channel does not send any service data.

An E1-F interface supports two interframe filling tags: 0x7e and 0xff. The default interframe filling tag 0x7e is recommended.

Precautions

- Interfaces on both ends can communicate only when the same interframe filling tag and the same number of interframe filling tags are set for them.
- An E1-F interface cannot achieve the bandwidth because of extra costs of interframe filling tags. To improve the transmission rate of the E1-F interface, run the **fe1 itf number** command to set the number of interframe filling tags to 0.

Example

Set the interframe filling tag to 0xff on E1-F 1/0/0.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] fe1 itf type ff
```

 Copyright © Huawei Technologies Co., Ltd.

5.8.11 fe1 line-termination

Function

Using the **fe1 line-termination** command, you can set the cable type for an E1-F interface.

Using the **undo fe1 line-termination** command, you can restore the default cable type.

By default, the cable type applicable to an E1-F interface is 120 ohm balanced cable (twisted pair).

Format

fe1 line-termination { **75-ohm** | **120-ohm** }

undo fe1 line-termination

Parameters

Parameter	Description	Value
75-ohm	Indicates that an E1-F interface connects to a 75 ohm non-balanced cable (coaxial cable).	-
120-ohm	Indicates that an E1-F interface connects to a 120 ohm balanced cable (twisted pair).	-

Views

E1-F interface view

Default Level

2: Configuration level

Usage Guidelines

An E1-F interface can connect to a twisted pair or coaxial cable. The resistance of a twisted pair is 120 ohm, and the resistance of a coaxial cable is 75 ohm.

This command is required when the type of the cable connected to an E1-F interface changes.

Example

Set the cable type to coaxial cable for E1-F 1/0/0.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] fe1 line-termination 75-ohm
```

 Copyright © Huawei Technologies Co., Ltd.

5.8.12 fe1 loopback

Function

Using the **fe1 loopback** command, you can enable loopback detection on an E1-F interface.

Using the **undo fe1 loopback** command, you can disable loopback detection on an E1-F interface.

By default, loopback detection is disabled on an E1-F interface.

Format

fe1 loopback { **local** | **payload** | **remote** }

undo fe1 loopback

Parameters

Parameter	Description	Value
local	Indicates internal loopback.	-
payload	Indicates payload loopback.	-
remote	Indicates external loopback.	-

Views

E1-F interface view

Default Level

2: Configuration level

Usage Guidelines

The loopback detection function monitors the interface status or cable status and must be disabled when devices are working properly.

- Internal loopback tests whether the local device works properly by looping back outgoing packets to the local device.
- Payload loopback tests whether the local device works properly by looping back the valid payload of outgoing packets. Generally, frames transmitted by timeslot 0 are not looped back.
- External loopback tests whether the link between the local and remote devices works properly by looping back the packets received from the remote device.

Copyright © Huawei Technologies Co., Ltd.

Example

Enable internal loopback detection on E1-F 1/0/0.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] fe1 loopback local
```

5.8.13 fe1 sa

Function

The **fe1 sa** command sets the content of the five outgoing sa bits.

The **undo fe1 sa** command restores the default setting.

By default, the content of the five outgoing sa bits is 0.

Format

fe1 sa *sa4 sa5 sa6 sa7 sa8*

undo fe1 sa

Parameters

Parameter	Description	Value
sa4	Specifies the content of the outgoing sa4 bit.	The value is an integer that ranges from 0 to 255.
sa5	Specifies the content of the outgoing sa5 bit.	The value is an integer that ranges from 0 to 255.
sa6	Specifies the content of the outgoing sa6 bit.	The value is an integer that ranges from 0 to 255.
sa7	Specifies the content of the outgoing sa7 bit.	The value is an integer that ranges from 0 to 255.
sa8	Specifies the content of the outgoing sa8 bit.	The value is an integer that ranges from 0 to 255.

Views

E1-F interface view

Default Level

2: Configuration level

 Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

Usage Scenario

When an E1-F interface works in framed mode, SA4 to SA8 in the E1 frame can be used for transmitting low-speed data. By default, the values of SA4 to SA8 are 0. In some scenarios, the remote device will check received SA fields. Therefore, SA fields must be configurable on the router to ensure normal connection of the E1-F interface.

Prerequisites

The E1-F interface must work in framed mode.

By default, an E1-F interface works in framed mode. If an E1-F interface works in unframed mode, run the **undo fe1 unframed** command to configure the E1-F interface to work in framed mode. To view the working mode of an E1-F interface, run the **display fe1** command.

Precautions

By default, the SA field value is 0. Before configuring the SA field, collect configuration information on the remote device.

Example

Set the content of five outgoing sa bits to 1, 2, 3, 4, and 5 respectively.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] fe1 sa 1 2 3 4 5
```

5.8.14 fe1 timeslot-list

Function

Using the **fe1 timeslot-list** command, you can bundle timeslots on an E1-F interface into a channel.

Using the **undo fe1 timeslot-list** command, you can restore the default setting.

By default, all timeslots of an E1-F interface are bundled, and the rate of the E1-F interface is 1984 kbit/s.

Format

fe1 timeslot-list *list*

undo fe1 timeslot-list

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
list	Specifies the numbers of timeslots to be bundled.	The value is an integer that ranges from 1 to 31. You can specify a single timeslot by using *number*, specify a timeslot range by using *number1-number2*, or specify multiple timeslots by using *number1, number2-number3*.

Views

E1-F interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

When an E1-F interface works in framed mode, its 2 Mbit/s transmission line is divided into 32 timeslots (64 kbit/s in each timeslot). Timeslot 0 transmits frame alignment signals, and any of timeslots 1 to 31 can be bundled into a channel. The rate of an E1-F interface is *n* x 64 kbit/s, in which *n* is the number of timeslots bundled into a channel. An E1-F interface working in framed mode supports link layer protocols such as Point-to-Point Protocol (PPP), High-Level Data Link Control (HDLC), and Frame Relay (FR) and network protocols such as IP.

Prerequisite

The E1-F interface must work in framed mode.

By default, an E1-F interface works in framed mode. If an E1-F interface works in unframed mode, run the **undo fe1 unframed** command to configure the E1-F interface to work in framed mode. To view the working mode of an E1-F interface, run the **display fe1** command.

Example

Bundle timeslots 1, 2, 3, 8, and 10 of E1-F 1/0/0 into a channel.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] fe1 timeslot-list 1-3,8,10
```

Related Topics

5.8.2 display fe1

5.8.15 fe1 unframed

Copyright © Huawei Technologies Co., Ltd.

5.8.15 fe1 unframed

Function

Using the **fe1 unframed** command, you can configure an E1-F interface to work in unframed mode.

Using the **undo fe1 unframed** command, you can configure an E1-F interface to work in framed mode.

By default, an E1-F interface works in framed mode.

Format

fe1 unframed

undo fe1 unframed

Parameters

None

Views

E1-F interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

An E1-F interface works in either of the following modes:

- In unframed mode, an E1-F interface works at a rate of 2.048 Mbit/s without timeslot division. Similar to a synchronous serial interface, an E1-F interface supports link layer protocols such as PPP, HDLC, FR, and IP.
- In framed mode, an E1-F interface is divided into 32 timeslots, which are numbered 0 to 31. Timeslot 0 transmits frame alignment signals. Any random group of timeslots 1 to 31 can be bundled into a channel. The rate of an E1-F interface is *n* x 64 kbit/s, in which *n* is the number of timeslots bundled into a channel.

In either unframed mode or framed mode, an E1-F interface is similar to a synchronous serial interface and supports link layer protocols such as the Point-to-Point Protocol (PPP), High-Level Data Link Control (HDLC), and Frame Relay (FR) and network protocols such as IP.

If an E1-F interface is connected to an E1 leased line (2 Mbit/s), configure the E1-F interface to work in unframed mode. If an E1-F interface is connected to a low-rate (1 Mbit/s or 512 kbit/s) line, configure the E1-F interface to work in framed mode.

Follow-up Procedure

 Copyright © Huawei Technologies Co., Ltd.

If an E1-F interface works in framed mode, you can run the **fe1 timeslot-list** command to specify the timeslots to be bundled.

Example

Configure E1-F 1/0/0 to work in unframed mode.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] fe1 unframed
```

Related Topics

5.8.14 fe1 timeslot-list

5.8.16 reset framerstatics

Function

The **reset framerstatics** command clears error frame statistics on an interface.

Format

reset framerstatics [**fe1 interface** *interface-type interface-number* | **ft1 interface** *interface-type interface-number* | **controller e1** *interface-number*]

Parameters

Parameter	Description	Value
fe1 interface *interface-type interface-number*	Clears error frame statistics on a specified E1-F interface.	-
ft1 interface *interface-type interface-number*	Clears error frame statistics on a specified T1-F interface.	-
controller e1 *interface-number*	Clears error frame statistics on a specified CE1/PRI interface.	-

Views

User view

Default Level

2: Configuration level

Usage Guidelines

You can run the **reset framerstatics** command to clear error frame statistics on an interface. The statistics cannot be restored after being cleared.

 Copyright © Huawei Technologies Co., Ltd.

Example

Clear error frame statistics on the interface E13/0/0.

```
<Huawei> reset framerstatics controller e1 3/0/0
```

5.8.17 set workmode e1t1-f

Function

The **set workmode e1t1-f** command sets the working mode of a 1E1T1-F/2E1T1-F interface card.

By default, a 1E1T1-F/2E1T1-F interface card works in E1-F mode.

NOTE

The 4E1T1-F/8E1T1-F interface card only works in E1-F mode and does not support working mode switching.

Format

set workmode slot *slot-id* **e1t1-f** { **e1-f** | **t1-f** }

Parameters

Parameter	Description	Value
slot *slot-id*	Specifies the slot ID of a 1E1T1-F/2E1T1-F interface card.	Run the **display device** command to view slot IDs and types of interface cards and find the slot ID with E1/T1-F displayed. Then run the **display workmode** command to view the interface card work mode on the device.
e1-f	Indicates a 1E1T1-F/2E1T1-F interface card works in fractional channelized E1 (E1-F) mode.	-
t1-f	Indicates a 1E1T1-F/2E1T1-F interface card works in fractional channelized T1 (T1-F) mode.	-

Views

System view

Default Level

3: Management level

Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

Usage Scenario

A 1E1T1-F interface card provides one fractional channelized E1/T1 interface and a 2E1T1-F interface card provides two fractional channelized E1/T1 interfaces. A 1E1T1-F/2E1T1-F interface card cannot both provide E1-F and T1-F interfaces. The **set workmode e1t1-f** command sets the working mode of a 1E1T1-F/2E1T1-F interface card.

Precautions

After this command is used, the system prompts you to reset the 1E1T1-F/2E1T1-F interface card to make the new working mode take effect. If you select **Yes**, the system resets the interface card. Otherwise, you need to run the **reset slot** command to manually reset the interface card to make the new working mode take effect.

Example

Configure the 2E1T1-F interface card in slot 1 to work in T1-F mode.

```
<Huawei> system-view
[Huawei] set workmode slot 1 e1t1-f t1-f
Warning: Changing the working mode will reset the board in slot 1. Continue? [y/
n]:y
INFO: Resetting board[1] succeeded.
```

Related Topics

4.1.3 display device

5.8.3 display workmode

4.2.13 reset slot

5.9 T1-F Interface Configuration Commands

5.9.1 crc

Function

The **crc** command configures the cyclic redundancy check (CRC) mode of a synchronous serial interface.

The **undo crc** command restores the default CRC mode of a synchronous serial interface.

By default, the 16-bit CRC is used.

Format

crc { **16** | **32** | **none** }

undo crc

 Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
16	Indicates the 16-bit CRC.	-
32	Indicates the 32-bit CRC.	-
none	Indicates that the synchronous serial interface does not perform CRC.	-

Views

Interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

CRC is a commonly used method to detect transmission errors in a communication system. It checks for transmission errors by adding redundancy codes to the original data. Transmission errors are more likely to be detected when more redundancy codes are added, but data is transmitted at a lower efficiency. Use the 16-bit or 32-bit CRC mode as required.

Precautions

- Interfaces that support CRC include:
  - Synchronous/asynchronous serial interfaces that work in synchronous mode. The interface name is Serial.
  - Interfaces formed by CE1/PRI and CT1/PRI interfaces. The interface name is Serial and the interface logic is the same as that of synchronous serial interfaces.
  - Interfaces formed by CE3 interfaces. The interface name is Serial and the interface logic is the same as that of synchronous serial interfaces.
  - Interfaces formed by E1-F and T1-F interfaces. The interface name is Serial and the interface logic is the same as that of synchronous serial interfaces.
  - Interfaces formed by E1/T1 interfaces that are channelized from CPOS interfaces. The interface name is Serial and the interface logic is the same as that of synchronous serial interfaces.
- The synchronous serial interfaces on both ends of a link must use the CRC of the same length. If lengths of the CRCs used on two ends are different, the two devices cannot communicate with each other.

 Copyright © Huawei Technologies Co., Ltd.

Example

Set the CRC mode to 32-bit CRC on Serial 1/0/0/0:0.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0/0:0
[Huawei-Serial1/0/0/0:0] crc 32
```

5.9.2 display ft1

Function

Using the **display ft1** command, you can view the configuration and alarm information about a specified T1-F interface.

Format

display ft1 serial *interface-number*

Parameters

Parameter	Description	Value
serial *interface-number*	Displays the configuration and alarm information about a specified T1-F interface.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

To ensure that devices on both ends communicate, T1-F interfaces on both ends must be configured with the same parameters except for the clock mode.

You can run the **display ft1** command to view the configuration of a specified T1-F interface. If the local configuration conflicts with the remote configuration, change the local configuration. You can also run the **display ft1** command to view the alarm information about the T1-F interface for fault location.

NOTE

This command is applicable only to T1-F interfaces.

Example

Display the configuration and alarm information about T1-F 1/0/0.

 Copyright © Huawei Technologies Co., Ltd.

```
<Huawei> display ft1 serial 1/0/0
Serial1/0/0
Basic Configuration:
  Work Mode is T1 Fractional Framed, Cable type is 100 Ohm balanced.
  Frame-format is ESF, Line Code is B8zs.
  Source Clock is Slave, Data-coding is Normal.
  Idle code is 7E, Itf type is 7E, Itf number is 4.
  Loopback is Not Set.
Alarm State:
  Receiver alarm state is None.
Historical Statistics:
  Data in current interval (0 seconds elapsed):
  0 Line Code Violations, 0 Path Code Violations
  0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
  0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
  Total Data (last 24 hours):
  5604553200 Line Code Violations, 0 Path Code Violations
  85520 Slip Secs, 85520 Fr Loss Secs, 85520 Line Err Secs, 0 Degraded Mins
  85520 Errored Secs, 0 Bursty Err Secs, 85520 Severely Err Secs, 85520 Unavail
Secs
```

Table 5-30 Description of the display ft1 command output

Item	Sub-item	Description
Basic Configuration	Work Mode is T1 Fractional Framed	The interface works in framed mode.
Basic Configuration	Cable type is 100 Ohm balanced.	The cable is connected to a 100 ohm balanced cable.
Basic Configuration	Frame-format	Frame format of the interface, which can be ESF or SF. To configure the frame format for a T1-F interface, run the **ft1 frame-format** command. • ESF: extended super frame format • SF: super frame format
Basic Configuration	Line Code	Encoding and decoding mode of the interface, which can be **B8ZS**.
Basic Configuration	Source Clock	Clock mode of the interface, which can be master or slave. To set the clock mode for a T1-F interface, run the **ft1 clock** command. • MASTER: indicates that the interface works in master clock mode and uses internal clock signals. • SLAVE: indicates that the interface works in slave clock mode and uses line clock signals.

Copyright © Huawei Technologies Co., Ltd.

Item	Sub-item	Description
Basic Configuration	Data-coding	Whether to invert data. The value can be **inverted** or **normal**: • inverted: The interface inverts data. • normal: The interface does not invert data. To configure data inversion, run the **ft1 data-coding** command.
Basic Configuration	Idle code	Line idle code of the interface, which can be 7E or FF. To set the line idle code for a T1-F interface, run the **ft1 idlecode** command.
Basic Configuration	Itf type	Interframe filling tag of the interface, which can be 7E or FF. To set the interframe filling tag for a T1-F interface, run the **ft1 itf** command.
Basic Configuration	Itf number	Number of interframe filling tags, which ranges from 0 to 14. To set the number of interframe filling tags for a T1-F interface, run the **ft1 itf** command.
Basic Configuration	Loopback	Whether loopback detection is enabled on the interface. If loopback detection has been enabled, the loopback detection mode is displayed. To enable loopback detection on a T1-F interface, run the **ft1 loopback** command. **NOTE** The loopback detection function detects the interface status or cable status and must be disabled when devices work properly.

 Copyright © Huawei Technologies Co., Ltd.

Item	Sub-item	Description
Alarm State	Receiver alarm state is None.	No alarm is received. If an alarm is generated, the specific alarm type is displayed. The following alarms may be generated: ● Loss-of-Signal (LOS): This alarm is generated when data transmission is interrupted or frames are lost because of severe problems, for example, the cable is broken or is not well connected. ● Alarm-Indication-Signal (AIS): This alarm is generated when the remote end fails to receive the frame alignment signals. This alarm generally indicates a fault on the remote device and is also called the upstream alarm. ● Loss-of-Frame (LOF): This alarm is generated when signals cannot be encapsulated in frames. It is usually generated with a LOS alarm and is cleared when frame alignment succeeds. ● Remote-Alarm-Indication (RAI): This alarm is generated when the remote end does not receive frames from the local end for some reasons, for example, the local end fails to send frames, the transmission line of the local end fails, or the remote end fails to receive frames. When a LOS, AIS, or LOF alarm is generated, the local end needs to send the RAI bit to the remote end. In addition, "Transmitter is sending remote alarm." is displayed.
Historical Statistics	Data in current interval	The current accumulation period.
Historical Statistics	Line Code Violations	Count of both Bipolar Violations (BPVs) and Excessive Zeros (EXZs) occurring over the accumulation period.
Historical Statistics	Path Code Violations	Frame synchronization bit error in the E1-noCRC formats or a CRC error in the E1-CRC formats.
Historical Statistics	Slip Secs	A second with one or more out of frame defects or a detected incoming AIS.
Historical Statistics	Fr Loss Secs	Number of seconds an Out Of Frame (OOF) error is detected.
Historical Statistics	Line Err Secs	A second in which one or more code violations occurred or one or more LOS defects.

Copyright © Huawei Technologies Co., Ltd.

Item	Sub-item	Description
Historical Statistics	Degraded Mins	One in which the estimated error rate exceeds 1E-6 but does not exceed 1E-3.
Historical Statistics	Errored Secs	A second with one or more path coding violations, one or more Out of Frame defects, or one or more controlled slip events or a detected AIS defect.
Historical Statistics	Bursty Err Secs	A second with fewer than 320 and more than one path coding violation error events, no Severely Errored Frame defects, and no detected incoming AIS defects.
Historical Statistics	Severely Err Secs	A second with 320 or more path code violation errors events, one or more Out of Frame defects, or a detected AIS defect.
Historical Statistics	Unavail Secs	Number of seconds that the interface is unavailable.
Historical Statistics	Total Data	Displays total accumulated data for all intervals.

5.9.3 display workmode

Function

The **display workmode** command displays the working modes of interface cards.

Format

display workmode { **slot** *slot-id* | **all** }

Parameters

Parameter	Description	Value
slot *slot-id*	Displays the working mode of an interface card in a specified slot.	The value must be the slot ID of an interface card with a configurable working mode. The working mode of the following interface cards can be changed: 1E1T1-M/2E1T1-M, 1E1T1-F/2E1T1-F, 4G.SHDSL, VDSL2, 1CPOS-155M, 4STM1 and 2BST.

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
all	Displays the working mode of all interface cards with configurable working modes.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

This command applies to only the interface cards with configurable working mode. To configure the working mode of an interface card, run the **set workmode e1t1**, **set workmode e1t1-f**, **set workmode shdsl**, **set workmode vdsl**, **set workmode cpos**, **set workmode stm** or **set workmode bri** command.

Example

Display the working mode of the interface card in slot 2.

```
<Huawei> display workmode slot 2
-------------------------------------------------------------------------
Slot  Type              config-workmode     active-workmode
-------------------------------------------------------------------------
2     1CPOS-155M-W      e1-data             e1-data
```

Table 5-31 Description of the display workmode command output

Item	Description
Slot	Slot ID of the interface card.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
Type	Interface card type: • 1E1/T1-M • 2E1/T1-M • 4E1/T1-M • 8E1/T1-M • 1E1/T1-F • 2E1/T1-F • 4E1/T1-F • 8E1/T1-F • 4G.SHDSL • VDSL2 • 1CPOS-155M • 4STM1 • 2BST

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
config-workmode	config working mode: ● e1-data: The interface card works in CE1/PRI mode. ● e1-voice: The interface card is configured as an E1 voice card. ● t1-data: The interface card works in CT1/PRI mode. ● t1-voice: The interface card is configured as an T1 voice card. ● stm1: The interface card works in 4stm mode, that is, it provides four interfaces working at the rate of 155 Mbit/s. ● stm4: The interface card works in 1stm mode, that is, it provides one interface working at the rate of 622 Mbit/s. ● e1-f: The interface card works in E1-F mode. ● t1-f: The interface card works in T1-F mode. ● atm: The 4G.SHDSL interface card works in ATM mode. ● ptm: The 4G.SHDSL interface card works in PTM mode. ● bri-voice-nt: The voice interface card works in NT mode. ● bri-voice-te: The voice interface card works in TE mode.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
active-workmode	active working mode: • e1-data: The interface card works in CE1/PRI mode. • e1-voice: The interface card is configured as an E1 voice card. • t1-data: The interface card works in CT1/PRI mode. • t1-voice: The interface card is configured as an T1 voice card. • stm1: The interface card works in 4stm mode, that is, it provides four interfaces working at the rate of 155 Mbit/s. • stm4: The interface card works in 1stm mode, that is, it provides one interface working at the rate of 622 Mbit/s. • e1-f: The interface card works in E1-F mode. • t1-f: The interface card works in T1-F mode. • atm: The 4G.SHDSL interface card works in ATM mode. • ptm: The 4G.SHDSL interface card works in PTM mode. • bri-voice-nt: The voice interface card works in NT mode. • bri-voice-te: The voice interface card works in TE mode.

5.9.4 ft1 alarm-threshold

Function

Using the **ft1 alarm-threshold** command, you can configure alarm thresholds for a T1-F interface.

Using the **undo ft1 alarm-threshold** command, you can restore the default alarm thresholds for a T1-F interface.

The default alarm thresholds are as follows:

- Loss of signal (LOS) alarm: The value of pulse-detection is 176 and the value of pulse-recovery is 22, indicating that a LOS alarm is generated if less than 22 pulses are detected within 176 pulse intervals.

 Copyright © Huawei Technologies Co., Ltd.

- Alarm indication signal (AIS) alarm: level-1.
- Loss of frame alignment (LFA) alarm: level-1.

Format

ft1 alarm-threshold { **ais** { **level-1** | **level-2** } | **lfa** { **level-1** | **level-2** | **level-3** | **level-4** } | **los** { **pulse-detection** *value* | **pulse-recovery** *value* } }

undo ft1 alarm-threshold { **ais** | **lfa** | **los** { **pulse-detection** | **pulse-recovery** } }

Parameters

Parameter	Description	Value
ais { **level-1** | **level-2** }	Sets the AIS alarm threshold. • **level-1**: indicates that an AIS alarm is generated when there are less than two 0s in the bit stream of a super frame (SF) or extended super frame (ESF). • **level-2**: indicates that an AIS is generated when there is less than three 0s in the code stream of an SF or less than five 0s in the code stream of an ESF.	The default AIS alarm threshold is **level-1**.
lfa { **level-1** | **level-2** | **level-3** | **level-4** }	Sets the loss of frame alignment (LFA) alarm threshold. • **level-1**: indicates that an LFA alarm is generated when two of four frame alignment bits are lost. • **level-2**: indicates that an LFA alarm is generated when two of five frame alignment bits are lost. • **level-3**: indicates that an LFA alarm is generated when two of six frame alignment bits are lost. • **level-4**: indicates that an LFA alarm is generated when errors occur in four consecutive ESF frames. This keyword is valid only for the ESF format.	The default LFA alarm threshold is **level-1**.

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
los { **pulse-detection** *value* | **pulse-recovery** *value*	Sets the LOS alarm threshold. • **pulse-detection** specifies the LOS detection period, expressed by the number of pulse intervals. • **pulse-recovery** specifies the pulse threshold. A LOS alarm is generated when the number of pulses detected within the specified number of pulse intervals is less than the value of **pulse-recovery**.	The value of **pulse-detection** ranges from 16 to 4096, and the value of **pulse-recovery** ranges from 1 to 256. By default, the value of **pulse-detection** is 176 and the value of **pulse-recovery** is 22, indicating that a LOS alarm is generated if less than 22 pulses are detected within 176 pulse intervals. The value of **pulse-detection** ranges from 16 to 4096, and the value of **pulse-recovery** ranges from 1 to 256. By default, the value of **pulse-detection** is 176 and the value of **pulse-recovery** is 22, indicating that a LOS alarm is generated if less than 22 pulses are detected within 176 pulse intervals.

Views

T1-F interface view

Default Level

2: Configuration level

Usage Guidelines

None

Example

Set the LOS detection period to 300 pulse intervals.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] ft1 alarm-threshold los pulse-detection 300
```

 Copyright © Huawei Technologies Co., Ltd.

5.9.5 ft1 cable

Function

Using the **ft1 cable** command, you can set the attenuation or length of the transmission line matching a T1-F interface.

Using the **undo ft1 cable** command, you can restore the default transmission line configuration.

The default attenuation of the transmission line on a T1-F interface is -7.5 db.

Format

ft1 cable { **long** { **-7.5db** | **-15db** | **-22.5db** } | **short** { **133ft** | **266ft** | **399ft** | **533ft** | **655ft** } }

undo ft1 cable

Parameters

Parameter	Description	Value
long { **-7.5db** | **-15db** | **-22.5db**	Sets the attenuation of the transmission line matching the T1-F interface. This parameter is applicable to transmission lines longer than 655 feet. The attenuation of such transmission lines can be -7.5 db, -15 db, or -22.5 db. Set the attenuation based on quality of received signals. Transmission lines with a lower quality have a larger attenuation. When received signals are of low quality, set this parameter to offset the attenuation.	-
short { **133ft** | **266ft** | **399ft** | **533ft** | **655ft** }	Sets the length of the transmission line matching the T1-F interface. This parameter is applicable to transmission lines not longer than 665 feet. The length can be 133 feet, 266 feet, 399 feet, 533 feet, or 655 feet.	-

Views

T1-F interface view

Default Level

2: Configuration level

Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

This command is required only when received signals are of a low quality. The command determines the waveform of transmitted signals.

When signals that the device receives are of a good quality, use the default configuration.

Example

Set the length of the transmission line matching T1-F interface Serial 1/0/0 to 133 feet.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] ft1 cable short 133ft
```

5.9.6 ft1 clock

Function

Using the **ft1 clock** command, you can set the clock mode for a T1-F interface.

Using the **undo ft1 clock** command, you can restore the default setting.

By default, a T1-F interface works in slave clock mode and uses line clock signals.

Format

ft1 clock { **master** | **slave** | **system** }

undo ft1 clock

Parameters

Parameter	Description	Value
master	Configures a T1-F interface to work in master clock mode and use internal clock signals. When a T1-F interface functions as a Data Circuit-terminating Equipment (DCE), it must work in master clock mode and provide clock signals for a Data Terminal Equipment (DTE).	-
slave	Configures a T1-F interface to work in slave clock mode and use line clock signals. When a T1-F interface functions as a DTE, it must work in slave clock mode and obtain clock signals from a DCE.	-
system	Configures a T1-F interface to work in system clock mode and use line clock signals.	-

Views

T1-F interface view

Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

To exchange data correctly, communicating parties must work in clock synchronization state.

Precautions

When T1-F interfaces of two devices are directly connected, one T1-F interface must work in master clock mode and the other in slave clock mode.

Example

Configure T1-F interface Serial 1/0/0 to work in master clock mode.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] ft1 clock master
```

5.9.7 ft1 data-coding

Function

Using the **ft1 data-coding** command, you can determine whether data is inverted by a T1-F interface.

Using the **undo ft1 data-coding** command, you can restore the default setting.

By default, a T1-F interface does not invert data.

Format

ft1 data-coding { **inverted** | **normal** }

undo ft1 data-coding

Parameters

Parameter	Description	Value
inverted	Configures a T1-F interface to invert data.	-
normal	Configures a T1-F interface not to invert data.	-

Views

T1-F interface view

 Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

Data inversion indicates that every "1" bit in the data stream becomes a "0" bit and every "0" bit becomes a "1" bit.

Devices on both ends can communicate only when the same data inversion configuration is performed on T1-F interfaces on both devices.

Example

Configure T1-F interface Serial 1/0/0 to invert data.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] ft1 data-coding inverted
```

5.9.8 ft1 detect-rai

Function

Using the **ft1 detect-rai** command, you can enable remote alarm indication (RAI) detection on a T1-F interface.

Using the **undo ft1 detect-rai** command, you can disable RAI detection.

By default, RAI detection is enabled on a T1-F interface.

Format

ft1 detect-rai

undo ft1 detect-rai

Parameters

None

Views

T1-F interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

If RAI detection is enabled, a device sends an RAI alarm to its peer device after detecting loss of frame (LoF) caused by clock asynchronization or loss of signal (LoS).

 Copyright © Huawei Technologies Co., Ltd.

Prerequisites

The frame format has been set to extended super frame (ESF) by using the **ft1 frame-format esf** command.

Example

Disable RAI detection on T1-F interface Serial 1/0/0.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] undo ft1 detect-rai
```

Related Topics

5.9.2 display ft1

5.9.9 ft1 frame-format

Function

Using the **ft1 frame-format** command, you can set the frame format for a T1-F interface.

Using the **undo ft1 frame-format** command, you can restore the default setting.

By default, a T1-F interface uses the extended super frame (ESF) format.

Format

ft1 frame-format { **esf** | **sf** }

undo ft1 frame-format

Parameters

Parameter	Description	Value
esf	Sets the frame format to ESF.	-
sf	Sets the frame format to super frame (SF).	-

Views

T1-F interface view

Default Level

2: Configuration level

Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

A T1-F interface supports the SF format and ESF format. The two formats enable multiple frames to share the frame alignment information and signaling information so that more bits can be used to transmit data.

- SF: consists of 12 frames that share the frame alignment information and signaling information. Frame 6 and frame 12 are signaling frames.
- ESF: consists of 24 frames that share the frame alignment information and signaling information. Frames 6, 12, 18, and 24 are signaling frames.

Example

Set the frame format on T1-F interface Serial 1/0/0 to SF.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] ft1 frame-format sf
```

5.9.10 ft1 idlecode

Function

Using the **ft1 idlecode** command, you can set the line idle code for a T1-F interface.

Using the **undo ft1 idlecode** command, you can restore the default setting.

By default, the line idle code of a T1-F interface is 0x7e.

Format

ft1 idlecode { **7e** | **ff** }

undo ft1 idlecode

Parameters

Parameter	Description	Value
7e	Sets the line idle code to 0x7e.	-
ff	Sets the line idle code to 0xff.	-

Views

T1-F interface view

Default Level

2: Configuration level

 Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

Usage Scenario

A T1-F interface transmits electrical signals, and therefore the interface line keeps transmitting data. When no data is being transmitted, a line idle code needs to be filled.

The line idle code is the code sent over the timeslot that is not bundled to form any logical channel.

A T1-F interface supports two line idle codes: 0x7e and 0xff. The default line idle code 0x7e is recommended.

Precautions

Devices on both ends can communicate properly only when the same line idle code is set for T1-F interfaces on both devices.

Example

Set the line idle code to 0xff for T1-F interface Serial 1/0/0.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] ft1 idlecode ff
```

5.9.11 ft1 itf

Function

Using the **ft1 itf** command, you can set the interframe filling tag and the number of interframe filling tags on a T1-F interface.

Using the **undo ft1 itf** command, you can restore the default setting.

By default, a T1-F interface uses the interframe filling tag 0x7e and four interframe filling tags.

Format

ft1 itf { **number** *number* | **type** { **7e** | **ff** } }

undo ft1 itf { **number** | **type** }

Parameters

Parameter	Description	Value
number *number*	Specifies the number of interframe filling tags.	The value is an integer that ranges from 0 to 14. Specially, the value ranges from 0 to 7 for the T1-F interface on the AR2204-FE.

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
type	Specifies the interframe filling tag.	-
7e	Sets the interframe filling tag to 0x7e.	-
ff	Sets the interframe filling tag to 0xff.	-

Views

T1-F interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The interframe filling tag is the code sent when the timeslot bundled to form a logical channel does not send any service data.

A T1-F interface supports two interframe filling tags: 0x7e and 0xff. The default interframe filling tag 0x7e is recommended.

Precautions

- Devices on both ends can communicate properly only when the same interframe filling tag and the same number of interframe filling tags are set on T1-F interfaces of both devices.
- A T1-F interface cannot achieve the bandwidth because of extra costs of interframe filling tags. To improve the transmission rate of the T1-F interface, run the **ft1 itf number** command to set the number of interframe filling tags to 0.

Example

Set the interframe filling tag to 0xff on T1-F interface Serial 1/0/0.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] ft1 itf type ff
```

5.9.12 ft1 loopback

Function

Using the **ft1 loopback** command, you can enable loopback detection on a T1-F interface.

Copyright © Huawei Technologies Co., Ltd.

Using the **undo ft1 loopback** command, you can restore the default setting.

By default, loopback detection is disabled.

Format

ft1 loopback { **local** | **payload** | **remote** }

undo ft1 loopback

Parameters

Parameter	Description	Value
local	Sets internal loopback.	-
payload	Sets payload loopback.	-
remote	Sets external loopback.	-

Views

T1-F interface view

Default Level

2: Configuration level

Usage Guidelines

The loopback detection function detects the interface status or cable status and must be disabled when devices work properly.

- In internal loopback mode, the local device loops back outgoing packets to itself to test whether it works properly.
- In payload loopback mode, the local device loops back the valid payload of outgoing packets to itself. Generally, the synchronization signals transmitted by timeslot 0 are not looped back to the local device.
- In external loopback mode, the local device loops back the packets received from its peer device to the peer device to test whether the link between the two devices works properly.

Example

Enable internal loopback detection on T1-F interface Serial 1/0/0.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] ft1 loopback local
```

 Copyright © Huawei Technologies Co., Ltd.

5.9.13 ft1 timeslot-list

Function

Using the **ft1 timeslot-list** command, you can configure timeslot bundling on a T1-F interface.

Using the **undo ft1 timeslot-list** command, you can restore the default configuration.

By default, all timeslots of a T1-F interface are bundled. The default rate of a T1-F interface is 1536 kbit/s.

Format

ft1 timeslot-list *list* [**speed** { **56k** | **64k** }]

undo ft1 timeslot-list

Parameters

Parameter	Description	Value
list	Specifies the timeslot to be bundled.	*list* specifies the number of a timeslot, and its value ranges from 1 to 24. You can specify a single timeslot by using *number*, specify a timeslot range by using *number1-number2*, or specify multiple timeslots by using *number1,number2-number3*.
speed { **56k** | **64k** }	Specifies the speed of each timeslot, in kbit/s. When **56k** is specified, the speed of a channel set is *n* x 56 kbit/s. When **64k** is specified, the speed of a channel set is *n* x 64 kbit/s. *n* is the number of timeslots in a channel set. By default, the speed of each timeslot in a channel set is 64 kbit/s.	-

Views

T1-F Interface view

Default Level

2: Configuration level

Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

After timeslots of a T1-F interface are bundled, the interface rate changes accordingly. For example, when 10 timeslots 1 through 10 of a T1-F interface are bundled, the interface rate changes to 10 x 64 kbit/s or 10 x 56 kbit/s. Timeslots of a T1-F interface can be bundled into only one channel, which is the synchronous serial interface of this T1-F interface.

Example

Bundle timeslots 1, 2, 3, 8, and 10 of T1-F 1/0/0 into a channel.

```
<Huawei> system-view
[Huawei] interface serial 1/0/0
[Huawei-Serial1/0/0] ft1 timeslot-list 1-3,8,10
```

Related Topics

5.9.2 display ft1

5.9.14 set workmode e1t1-f

Function

The **set workmode e1t1-f** command sets the working mode of a 1E1T1-F/2E1T1-F interface card.

By default, a 1E1T1-F/2E1T1-F interface card works in E1-F mode.

NOTE

The 4E1T1-F/8E1T1-F interface card only works in E1-F mode and does not support working mode switching.

Format

set workmode slot *slot-id* **e1t1-f** { **e1-f** | **t1-f** }

Parameters

Parameter	Description	Value
slot *slot-id*	Specifies the slot ID of a 1E1T1-F/2E1T1-F interface card.	Run the **display device** command to view slot IDs and types of interface cards and find the slot ID with E1/T1-F displayed. Then run the **display workmode** command to view the interface card work mode on the device.
e1-f	Indicates a 1E1T1-F/2E1T1-F interface card works in fractional channelized E1 (E1-F) mode.	-

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
t1-f	Indicates a 1E1T1-F/2E1T1-F interface card works in fractional channelized T1 (T1-F) mode.	-

Views

System view

Default Level

3: Management level

Usage Guidelines

Usage Scenario

A 1E1T1-F interface card provides one fractional channelized E1/T1 interface and a 2E1T1-F interface card provides two fractional channelized E1/T1 interfaces. A 1E1T1-F/2E1T1-F interface card cannot both provide E1-F and T1-F interfaces. The **set workmode e1t1-f** command sets the working mode of a 1E1T1-F/2E1T1-F interface card.

Precautions

After this command is used, the system prompts you to reset the 1E1T1-F/2E1T1-F interface card to make the new working mode take effect. If you select **Yes**, the system resets the interface card. Otherwise, you need to run the **reset slot** command to manually reset the interface card to make the new working mode take effect.

Example

Configure the 2E1T1-F interface card in slot 1 to work in T1-F mode.

```
<Huawei> system-view
[Huawei] set workmode slot 1 e1t1-f t1-f
Warning: Changing the working mode will reset the board in slot 1. Continue? [y/
n]:y
INFO: Resetting board[1] succeeded.
```

Related Topics

4.1.3 display device

5.5.9 display workmode

4.2.13 reset slot

5.10 E&M Interface Configuration Commands

Copyright © Huawei Technologies Co., Ltd.

5.10.1 display em clock-mode

Function

The **display em clock-mode** command displays the clock source mode of the 6E&M card.

Format

display em clock-mode

Parameters

None

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

The 6E&M card is typically used for Very High Frequency (VHF) data transmission and uses the Time-Division Multiplexing (TDM) protocol. By default, the card uses the built-in clock as the clock source. When the card works in transparent transmission mode, bit errors occur in TDM transmission when the frequency offset exists between the clock of the card and the system clock of the device. By checking the working mode of the card's clock source, you can determine whether to configure the clock working mode for the card.

Example

Display the clock mode of the 6E&M card.

```
<Huawei> display em clock-mode
  Info: The 6E&M boards work in BOARD mode.
```

Table 5-32 Description of the **display em clock-mode** command output

Item	Description
Info: The 6E&M boards work in BOARD mode.	Clock mode of the 6E&M card. • BOARD: uses the built-in clock source of the 6E&M card. • SYSTEM: uses the system clock.

Copyright © Huawei Technologies Co., Ltd.

5.10.2 em clock

Function

The **em clock** command sets the clock mode of a 6E&M card.

The **undo em clock** command restores the default setting.

By default, the clock mode of the 6E&M card is **board**.

Format

em clock { **system** | **board** }

undo em clock

Parameters

Parameter	Description	Value
system	Sets the clock mode of the 6E&M card to system clock mode.	-
board	Sets the clock mode of the 6E&M card to built-in clock mode.	-

Views

System view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The 6E&M card is typically used for Very High Frequency (VHF) data transmission and uses the Time-Division Multiplexing (TDM) protocol. By default, the card uses the built-in clock as the clock source. When the card works in transparent transmission mode, bit errors occur in TDM transmission when the frequency offset exists between the clock of the card and the system clock of the device. To solve this problem, you need to configure the card to work in the system clock mode to eliminate the bit errors caused by the frequency offset of the clock source.

Precautions

If a router is directly connected to the 6E&M card of the peer device, you need to run the **em clock** command on both ends.

Clock synchronization channels (for example, connecting through E1 interfaces) are available between devices. Run the **fe1 clock system** command on the main E1 interface for clock synchronization to configure the interface to use the system clock mode. Run the **clock source** command on the peer device to configure the

Copyright © Huawei Technologies Co., Ltd.

interface type of the clock source. Ensure that the clock sources of the devices at both ends are synchronized.

Example

Configure the 6E&M card to work in system clock mode. The main E1 interface for clock synchronization is Serial 4/0/0.

```
<Huawei> system-view
[Huawei] interface serial 4/0/0
[Huawei-Serial1/0/0] fe1 clock system
[Huawei-Serial1/0/0] quit
[Huawei] em clock system
```

5.10.3 em passthrough enable

Function

The **em passthrough enable** command enables data transparent transmission on an E&M interface.

The **undo em passthrough enable** command restores the default setting.

By default, data transparent transmission is disabled on an E&M interface.

Format

em passthrough enable

undo em passthrough enable

Parameters

None

Views

E&M interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Before the data processing center and E&M terminal transmit E&M data, you must enable data transparent transmission on E&M interfaces so that routers can transparently transmit E&M data through the MPLS tunnel.

Prerequisites

TDM has been configured as the link-layer protocol of the E&M interface using the **link-protocol tdm** command.

 Copyright © Huawei Technologies Co., Ltd.

Example

Enable data transparent transmission on E&M interface 2/0/0.

```
<Huawei> system-view
[Huawei] interface serial 2/0/0
[Huawei-Serial2/0/0] link-protocol tdm
[Huawei-Serial2/0/0] em passthrough enable
```

Related Topics

5.3.17 link-protocol tdm

5.10.4 em signal-mode

Function

The **em signal-mode** command sets the signaling mode of an E&M interface.

The **undo em signal-mode** command restores the default setting.

By default, the signaling mode of an E&M interface is Bell-5.

Format

em signal-mode { **bell-1** | **bell-2** | **bell-3** | **bell-4** | **bell-5** }

undo em signal-mode

Parameters

Parameter	Description	Setting
bell-1	Sets the signaling mode of an E&M interface to Bell-1. **NOTE** Currently, the device does not support the Bell-1 signaling mode.	-
bell-2	Sets the signaling mode of an E&M interface to Bell-2. **NOTE** Currently, the device does not support the Bell-2 signaling mode.	-
bell-3	Sets the signaling mode of an E&M interface to Bell-3. **NOTE** Currently, the device does not support the Bell-3 signaling mode.	-

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Setting
bell-4	Sets the signaling mode of an E&M interface to Bell-4. **NOTE** Currently, the device does not support the Bell-4 signaling mode.	-
bell-5	Sets the signaling mode of an E&M interface to Bell-5.	-

Views

E&M interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

When a router connects to a device through an E&M interface, the signaling modes on the router and the device must be same so that data can be transmitted between them. You can configure the signaling mode of the E&M interface on the router based on that of the connected interface of the device.

Prerequisites

TDM has been configured as the link-layer protocol of the E&M interface using the **link-protocol tdm** command.

Example

Set the signaling mode of E&M interface 2/0/0 to Bell-5.

```
<Huawei> system-view
[Huawei] interface serial 2/0/0
[Huawei-Serial2/0/0] link-protocol tdm
[Huawei-Serial2/0/0] em signal-mode bell-5
```

Related Topics

5.3.17 link-protocol tdm

Copyright © Huawei Technologies Co., Ltd.

5.10.5 em transmit gain

Function

The **em transmit gain** command configures the transmit signal gain level of an E&M interface.

The **undo em transmit gain** command restores the default configuration.

By default, the transmit signal gain level of an E&M interface is 14.

Format

em transmit gain *gain-level*

undo em transmit gain

Parameters

Parameter	Description	Value
gain-level	Specifies the transmit signal gain level of the E&M interface.	The value is an integer that ranges from 0 to 41. Different signal gain levels correspond to different signal gains. **Table 5-33** describes the mapping between the signal gain level and signal gain value.

Table 5-33 Mapping between the signal gain level and signal gain value

Gain Level	Gain Value
0	-7 dB
1	-6.5 dB
2	-6 dB
3	-5.5 dB
4	-5 dB
5	-4.5 dB
6	-4 dB
7	-3.5 dB
8	-3 dB
9	-2.5 dB

Copyright © Huawei Technologies Co., Ltd.

Gain Level	Gain Value
10	-2 dB
11	-1.5 dB
12	-1 dB
13	-0.5 dB
14	0 dB
15	0.5 dB
16	1 dB
17	1.5 dB
18	2 dB
19	2.5 dB
20	3 dB
21	3.5 dB
22	4 dB
23	4.5 dB
24	5 dB
25	5.5 dB
26	6 dB
27	6.5 dB
28	7 dB
29	7.5 dB
30	8 dB
31	8.5 dB
32	9 dB
33	9.5 dB
34	10 dB
35	10.5 dB
36	11 dB
37	11.5 dB
38	12 dB
39	12.5 dB

 Copyright © Huawei Technologies Co., Ltd.

Gain Level	Gain Value
40	13 dB
41	13.5 dB

Views

E&M interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

When a local user and a remote user are on a call, you can run the **em transmit gain** command to configure the transmit signal gain level of the E&M interface to adjust the call volume.

- When the remote user feels that the call volume is low and the call quality is poor, you can run the **em transmit gain** command on the local E&M interface to increase the transmit signal gain level.
- When the remote user feels that the call volume is high and the call quality is good, you can run the **em transmit gain** command on the local E&M interface to reduce the transmit signal gain level.

Prerequisite

The TDM protocol has been configured as the data link layer protocol of the E&M interface using the **link-protocol tdm** command.

Example

Set the transmit signal gain level of the E&M interface to 20.

```
<Huawei> system-view
[Huawei] interface serial 2/0/0
[Huawei-Serial2/0/0] link-protocol tdm
[Huawei-Serial2/0/0] em transmit gain 20
```

Related Topics

5.3.17 link-protocol tdm

5.10.6 em receive gain

Function

The **em receive gain** command configures the receive signal gain level of an E&M interface.

Copyright © Huawei Technologies Co., Ltd.

The **undo em receive gain** command restores the default configuration.

By default, the receive signal gain level of an E&M interface is 40.

Format

em receive gain *gain-value*

undo em receive gain

Parameters

Parameter	Description	Value
gain-value	Specifies the receive signal gain level of the E&M interface.	The value is an integer that ranges from 0 to 43. Different signal gain levels correspond to different signal gains. **Table 5-34** describes the mapping between the signal gain level and signal gain value.

Table 5-34 Mapping between the signal gain level and signal gain value

Gain Level	Gain Value
0	-20 dB
1	-19.5 dB
2	-19 dB
3	-18.5 dB
4	-18 dB
5	-17.5 dB
6	-17 dB
7	-16.5 dB
8	-16 dB
9	-15.5 dB
10	-15 dB
11	-14.5 dB
12	-14 dB
13	-13.5 dB

Copyright © Huawei Technologies Co., Ltd.

Gain Level	Gain Value
14	-13 dB
15	-12.5 dB
16	-12 dB
17	-11.5 dB
18	-11 dB
19	-10.5 dB
20	-10 dB
21	-9.5 dB
22	-9 dB
23	-8.5 dB
24	-8 dB
25	-7.5 dB
26	-7 dB
27	-6.5 dB
28	-6 dB
29	-5.5 dB
30	-5 dB
31	-4.5 dB
32	-4 dB
33	-3.5 dB
34	-3 dB
35	-2.5 dB
36	-2 dB
37	-1.5 dB
38	-1 dB
39	-0.5 dB
40	0 dB
41	0.5 dB
42	1 dB
43	1.5 dB

 Copyright © Huawei Technologies Co., Ltd.

Views

E&M interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

When a local user and a remote user are on a call, you can run the **em receive gain** command to configure the receive signal gain level of the E&M interface to adjust the call volume.

- When the local user feels that the call volume is low and the call quality is poor, you can run the **em receive gain** command on the local E&M interface to increase the receive signal gain level.
- When the local user feels that the call volume is high and the call quality is good, you can run the **em receive gain** command on the local E&M interface to reduce the receive signal gain level.

Prerequisite

The TDM protocol has been configured as the data link layer protocol of the E&M interface using the **link-protocol tdm** command.

Example

Set the receive signal gain level of the E&M interface to 20.

```
<Huawei> system-view
[Huawei] interface serial 2/0/0
[Huawei-Serial2/0/0] link-protocol tdm
[Huawei-Serial2/0/0] em receive gain 20
```

Related Topics

5.3.17 link-protocol tdm

5.10.7 em pcm

Function

The **em pcm** command configures the companding algorithm of pulse code modulation (PCM).

The **undo em pcm** command restores the default configuration.

By default, the PCM companding algorithm is A-law algorithm.

Copyright © Huawei Technologies Co., Ltd.

Format

em pcm { **a-law** | **u-law** }

undo em pcm

Parameters

Parameter	Description	Value
a-law	Specifies the A-law algorithm.	-
u-law	Specifies the u-law algorithm.	-

Views

E&M interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

There are two pulse code modulation (PCM) companding algorithms: A-law algorithm and u-law algorithm. The A-law algorithm is mainly used in digital communication systems of Europe and China. The u-law algorithm is mainly used in digital communication systems of North America and Japan.

Choose the PCM companding algorithm based on the standard used locally.

Prerequisite

The TDM protocol has been configured as the data link layer protocol of the E&M interface using the **link-protocol tdm** command.

Example

Set the PCM companding algorithm to the u-law algorithm.

```
<Huawei> system-view
[Huawei] interface serial 2/0/0
[Huawei-Serial2/0/0] link-protocol tdm
[Huawei-Serial2/0/0] em pcm u-law
```

Related Topics

5.3.17 link-protocol tdm

Copyright © Huawei Technologies Co., Ltd.

5.11 Cellular Interface Configuration Commands

NOTE

Cellular interfaces are classified into 3G cellular interfaces and LTE cellular interfaces.

Cellular channel interfaces are classified into 3G channel interfaces and LTE channel interfaces.

5.11.1 apn

Function

The **apn** command configures an APN in the APN profile.

The **undo apn** command deletes the configured APN from the APN profile.

By default, no APN is configured in the APN profile. During LTE dial-up, apn profile name specifies an access point name (APN) user name.

Format

apn *apn-name*

undo apn

Parameters

Parameter	Description	Value
apn-name	Specifies the name of the APN.	The value is a string of 1 to 99 case-sensitive characters without spaces.

Views

APN profile view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

An access point name (APN) identifies an external PDN network (for example, the Internet or IMS network) that users want to access.

You can run the **apn** command to configure an APN in the APN profile.

Precautions

Copyright © Huawei Technologies Co., Ltd.

- APNs are provided by the carrier.
- After an APN is configured, it is permanently recorded in a 3G or LTE modem. If the APN changes, reconfigure it.
- If the **apn** command is run repeatedly in the same APN profile view, the latest configuration overwrites the earlier ones.

Example

Configure an APN named **3gnet** in the APN profile.

```
<Huawei> system-view
[Huawei] apn profile 3gprofile
[Huawei-apn-profile-3gprofile] apn 3gnet
```

Related Topics

5.11.2 apn profile

5.11.2 apn profile

Function

The **apn profile** command creates an APN profile and displays the APN profile view.

The **undo apn profile** command deletes the created APN profile.

By default, no APN profile is created.

Format

apn profile *profile-name*

undo apn profile *profile-name*

Parameters

Parameter	Description	Value
profile-name	Specifies the name of the APN profile.	The value is a string of 1 to 64 case-sensitive characters without spaces.

Views

System view

Default Level

2: Configuration level

 Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

You can create an APN profile and configure an APN in the profile so that you can access external PDN networks using the configured APN.

If no APN profile is created, the device dynamically configures an APN.

Example

Configure the APN profile named **3gprofile** and enter the APN profile view.

```
<Huawei> system-view
[Huawei] apn profile 3gprofile
[Huawei-apn-profile-3gprofile]
```

Related Topics

5.11.3 apn-profile

5.11.67 user

5.11.3 apn-profile

Function

The **apn-profile** command binds an APN profile to a cellular interface or cellular channel interface.

The **undo apn-profile** command deletes the APN profile bound to a cellular interface or cellular channel interface.

By default, no APN profile is bound to a cellular interface or cellular channel interface.

Format

apn-profile *profile-name* [**priority** *priority*] [**track nqa** { *admin-name test-name* } &<1-2>]

undo apn-profile *profile-name*

Parameters

Parameter	Description	Value
profile-name	Specifies the name of the APN profile.	The value is a string of 1 to 64 case-sensitive characters without spaces.

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
priority *priority*	Specifies the priority of the APN profile.	The value is an integer that ranges from 1 to 255. The default value is 100. A larger value indicates a higher priority. When dual SIM cards are available, two APN profiles can be bound to an LTE cellular interface or LTE channel interface. The APN profile with a higher priority can access the LTE network first. You are advised to set the priority of the APN profile bound to the master SIM card to higher than that of the APN profile bound to the backup SIM card.
track nqa *admin-name test-name*	Specifies the administrator and name of an NQA test instance. If this parameter is specified, the device performs an NQA probe on the 3G or LTE network when the dial-up initiated through a cellular interface or cellular channel interface succeeds. The device terminates the 3G or LTE link after three consecutive NQA probe failures. Additionally, you can run the **dialer timer probe-interval** command to set the NQA probe interval. **NOTE** The NQA test instance type must be ICMP test. To specify this parameter, configure an NQA test instance and ensure that the route from the NQA test instance to the destination is reachable.	The value is a string of 1 to 32 case-sensitive characters without spaces.

Copyright © Huawei Technologies Co., Ltd.

Views

Cellular interface view, Cellular channel interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

After configuring an APN profile, you must bind the APN profile to a cellular interface or cellular channel interface so that the APN profile configuration takes effect on the cellular interface or cellular channel interface.

Prerequisites

Run the **dialer enable-circular** command to enable the circular DCC (C-DCC) function.

Precautions

After an APN profile is bound to a cellular interface or cellular channel interface, run the **shutdown** and **undo shutdown** commands or the **restart** command to restart the interface so that the configurations can take effect.

Example

Bind the APN profile 3Gnet to the cellular interface.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] dialer enable-circular
[Huawei-Cellular0/0/0] apn-profile 3Gnet
[Huawei-Cellular0/0/0] shutdown
[Huawei-Cellular0/0/0] undo shutdown
```

Related Topics

5.11.2 apn profile

5.11.4 apn user name catch-imsi-sn

Function

The **apn user name catch-imsi-sn** command enables the function of carrying the IMSI and SN in an APN user name.

The **undo apn user name catch-imsi-sn** command disables the function of carrying the IMSI and SN in an APN user name.

By default, the function of carrying the IMSI and SN in an APN user name is disabled.

 Copyright © Huawei Technologies Co., Ltd.

Format

apn user name catch-imsi-sn

undo apn user name catch-imsi-sn

Parameters

None

Views

System view

Default Level

2: Configuration level

Usage Guidelines

When a device connects to the Agile Controller-Campus, the Agile Controller-Campus allocates an IP address to the device based on the IMSI of the SIM card and the SN of the device. You can run the **apn user name catch-imsi-sn** command to enable the function of carrying the IMSI and SN in an APN user name, so that the device uses the APN user name carrying the IMSI and SN for LTE dialup to obtain an IP address from the Agile Controller-Campus.

Example

Enable the function of carrying the IMSI and SN in an APN user name.

```
<Huawei> system-view
[Huawei] apn user name catch-imsi-sn
```

Related Topics

5.11.24 imsi check

5.11.5 band gsm

Function

The **band auto** command deletes the configured frequency band of the GSM/WCDMA network and then LTE cellular interfaces can automatically select a frequency band to connect to the GSM/WCDMA network.

Format

band auto

Parameters

None

 Copyright © Huawei Technologies Co., Ltd.

Views

Cellular interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The networks of network carriers can provide multiple frequency bands for user access. To delete the configured frequency band of the network so that cellular interfaces can automatically select a frequency band, run the **band auto** command.

Precautions

- This command is valid only when the 3G modem is installed.
- When the network signal is weak, a modem is automatically migrated to another network for normal operation..

Example

Delete the configured frequency band of the network.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] band auto
```

5.11.6 band gsm

Function

The **band gsm** command sets the frequency band of the GSM network that 3G cellular interfaces are connected to.

By default, 3G cellular interfaces automatically select a frequency band to connect to the GSM network.

Format

band gsm { **gsm1800** | **gsm1900** | **gsm850** | **gsm900** }*

Parameters

Parameter	Description	Value
gsm1800	Indicates that the GSM network that 3G cellular interfaces are connected to works at the 1800 MHz frequency.	-

 Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
gsm1900	Indicates that the GSM network that 3G cellular interfaces are connected to works at the 1900 MHz frequency.	-
gsm850	Indicates that the GSM network that 3G cellular interfaces are connected to works at the 850 MHz frequency.	-
gsm900	Indicates that the GSM network that 3G cellular interfaces are connected to works at the 900 MHz frequency.	-

Views

Cellular interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

GSM networks of network carriers can provide multiple frequency bands for user access. When the frequency band of a GSM network changes after 3G cellular interfaces are connected to the GSM network, the 3G modem automatically adjusts the frequency band accordingly, which affects stability of 3G links.

When the frequency band of a GSM network that you access is fixed, you can run the **band gsm** command to set the frequency band of the GSM network that 3G cellular interfaces are connected to. This prevents frequency band changes caused by frequency interference and ensures 3G link stability.

Precautions

- This command is valid only when the 3G modem is installed.
- Run the **display cellular** *interface-number* **network** command to view the **Current Network Connection** field and check whether 3G cellular interfaces are connected to the GSM network.
- Confirm the frequency band of the GSM network in your location with the GSM network carrier to set the optimal frequency band.

 Copyright © Huawei Technologies Co., Ltd.

Example

Configure the GSM network to which 3G cellular interfaces are connected to work at the 1800 MHz frequency and 900 MHz frequency.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] band gsm gsm1800 gsm900
```

Related Topics

5.11.17 display cellular

5.11.7 band wcdma

5.11.7 band wcdma

Function

The **band wcdma** command sets the frequency band of the WCDMA network that 3G cellular interfaces are connected to.

By default, 3G cellular interfaces automatically select a frequency band to connect to the WCDMA network.

Format

band wcdma { **wcdma1900** | **wcdma2100** | **wcdma850** | **wcdma900** | **AWS** | **wcdma1700** }*

Parameters

Parameter	Description	Value
wcdma1700	Indicates that the WCDMA network that 3G cellular interfaces are connected to works at the 1700 MHz frequency.	-
wcdma1900	Indicates that the WCDMA network that 3G cellular interfaces are connected to works at the 1900 MHz frequency.	-
wcdma2100	Indicates that the WCDMA network that 3G cellular interfaces are connected to works at the 2100 MHz frequency.	-

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
wcdma850	Indicates that the WCDMA network that 3G cellular interfaces are connected to works at the 850 MHz frequency.	-
wcdma900	Indicates that the WCDMA network that 3G cellular interfaces are connected to works at the 900 MHz frequency.	-
AWS	Indicates that the WCDMA network that 3G cellular interfaces are connected to works at the 1700/2100 (US) MHz frequency.	-

Views

Cellular interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

WCDMA networks of network carriers can provide multiple frequency bands for user access. When the frequency band of a WCDMA network changes after 3G cellular interfaces are connected to the WCDMA network, the 3G modem automatically adjusts the frequency band accordingly, which affects stability of 3G links.

When the frequency band of a WCDMA network that you access is fixed, you can run the **band wcdma** command to set the frequency band of the WCDMA network that 3G cellular interfaces are connected to. This prevents frequency band changes caused by frequency interference and ensures 3G link stability.

Precautions

- This command is valid only when the 3G modem is installed.
- Run the **display cellular** *interface-number* **network** command to view the **Current Network Connection** field and check whether 3G cellular interfaces are connected to the WCDMA network.
- Confirm the frequency band of the WCDMA network in your location with the WCDMA network carrier to set the optimal frequency band.

 Copyright © Huawei Technologies Co., Ltd.

Example

Configure the WCDMA network to which 3G cellular interfaces are connected to work at the 1900 MHz frequency and 900 MHz frequency.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] band wcdma wcdma1900 wcdma900
```

Related Topics

5.11.17 display cellular

5.11.6 band gsm

5.11.8 band lte

Function

The **band lte** command allows you to manually set the frequency band of the LTE network that LTE cellular interfaces are connected to.

By default, LTE cellular interfaces automatically select a frequency band to connect to the LTE network.

Format

band lte { **band1** | **band2** | **band3** | **band4** | **band5** | **band7** | **band8** | **band12** | **band13** | **band17** | **band18** | **band19** | **band20** | **band26** | **band28** | **band34** | **band38** | **band39** | **band40** | **band41** }*

Parameters

Parameter	Description	Value
band1	Indicates that the frequency band of the LTE network is Band 1 (transmit: 1920 MHz to 1980 MHz; receive: 2110 MHz to 2170 MHz).	-
band2	Indicates that the frequency band of the LTE network is Band 2 (transmit: 1850 MHz to 1910 MHz; receive: 1930 MHz to 1990 MHz).	-
band3	Indicates that the frequency band of the LTE network is Band 3 (transmit: 1710 MHz to 1785 MHz; receive: 1805 MHz to 1880 MHz).	-

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
band4	Indicates that the frequency band of the LTE network is Band 4 (transmit: 1710 MHz to 1755 MHz; receive: 2110 MHz to 2155 MHz).	-
band5	Indicates that the frequency band of the LTE network is Band 5 (transmit: 824 MHz to 849 MHz; receive: 869 MHz to 894 MHz).	-
band7	Indicates that the frequency band of the LTE network is Band 7 (transmit: 2500 MHz to 2570 MHz; receive: 2620 MHz to 2690 MHz).	-
band8	Indicates that the frequency band of the LTE network is Band 8 (transmit: 880 MHz to 915 MHz; receive: 925 MHz to 960 MHz).	-
band13	Indicates that the frequency band of the LTE network is Band 13 (transmit: 777 MHz to 787 MHz; receive: 746 MHz to 756 MHz).	-
band17	Indicates that the frequency band of the LTE network is Band 17 (transmit: 704 MHz to 716 MHz; receive: 734 MHz to 746 MHz).	-
band18	Indicates that the frequency band of the LTE network is Band 8 (transmit: 815 MHz to 830 MHz; receive: 860 MHz to 875 MHz).	-

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
band19	Indicates that the frequency band of the LTE network is Band 17 (transmit: 830 MHz to 845 MHz; receive: 860 MHz to 875 MHz).	-
band20	Indicates that the frequency band of the LTE network is Band 20 (transmit: 832 MHz to 862 MHz; receive: 791 MHz to 821 MHz).	-
band26	Indicates that the frequency band of the LTE network is Band 28 (transmit: 816 MHz to 849 MHz; receive: 859 MHz to 894 MHz).	-
band28	Indicates that the frequency band of the LTE network is Band 28 (transmit: 703 MHz to 748 MHz; receive: 758 MHz to 803 MHz).	-
band38	Indicates that the frequency band of the LTE network ranges from 2570 MHz to 2620 MHz.	-
band39	Indicates that the frequency band of the LTE network ranges from 1880 MHz to 1920 MHz.	-
band40	Indicates that the frequency band of the LTE network ranges from 2300 MHz to 2400 MHz.	-
band41	Indicates that the frequency band of the LTE network ranges from 2496 MHz to 2690 MHz.	-

Views

Cellular interface view

 Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

LTE networks of network carriers can provide multiple frequency bands for user access. When the frequency band of an LTE network changes after LTE cellular interfaces are connected to the LTE network, the LTE modem automatically adjusts the frequency band accordingly, which affects stability of LTE links.

When the frequency band of an LTE network that you access is fixed, you can manually run the **band lte** command to set the frequency band of the LTE network that LTE cellular interfaces are connected to. This prevents frequency band changes caused by frequency interference and ensures LTE link stability.

Precautions

- This command is valid only when the LTE modem is installed.
- Run the **display cellular** *interface-number* **network** command to view the **Current Network Connection** field and check whether LTE cellular interfaces are connected to the LTE network.
- Confirm the frequency band of the LTE network in your location with the LTE network carrier to set the optimal frequency band.

Example

Manually configure the LTE network to which LTE cellular interfaces are connected to work at the Band 1 frequency.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] band lte band1
```

Related Topics

5.11.17 display cellular

5.11.6 band gsm

5.11.7 band wcdma

5.11.9 cellular log enable

Function

The **cellular log enable** command enables the WWAN log function.

The **undo cellular log enable** command disables the WWAN log function.

By default, the WWAN log function is disabled.

Format

cellular log enable

 Copyright © Huawei Technologies Co., Ltd.

undo cellular log enable

Parameters

None

Views

System view

Default Level

2: Configuration level

Usage Guidelines

To view changes of the signal strength, cell ID, or network type in WWAN logs, you can run the **cellular log enable** command to enable the WWAN log function.

- When the 3G signal strength changes, the device records the WWAN/5/WWAN_RSSI_NORMAL log or the WWAN/5/WWAN_RSSI_WEAK log.
- When the 3G signal strength changes, the device records the WWAN/5/WWAN_SINR_NORMAL log or WWAN/5/WWAN_SINR_WEAK log.
- When the cell ID changes, the device records the WWAN/5/WWAN_CELLID log.
- When the network type changes, the device records the WWAN/5/WWAN_NETWORK log.
- When Cellular interface received a network reject code, the device records the WWAN/5/WWAN_NETWORK_REJECT_CAUSE log.

Example

Enable the WWAN log function.

```
<Huawei> system-view
[Huawei] cellular log enable
```

5.11.10 cellular log rssi-threshold

Function

The **cellular log rssi-threshold** command configures the received signal strength indicator (RSSI) threshold used for determining the 3G signal strength.

The **undo cellular log rssi-threshold** command restores the RSSI threshold used for determining the 3G signal strength to the default value.

By default, the RSSI threshold used for determining the 3G signal strength is -89 dBm.

Format

cellular log rssi-threshold *rssi-threshold*

undo cellular log rssi-threshold

Parameters

Parameter	Description	Value
rssi-threshold	Specifies the RSSI threshold used for determining the 3G signal strength. • If the strength of received 3G signals is greater than the RSSI threshold 10 consecutive times, and the signal strength becomes normal, the device records the **WWAN/5/WWAN_RSSI_NORMAL** log. • If the strength of received 3G signals is not greater than the RSSI threshold 10 consecutive times, and the signal strength becomes weak, the device records the **WWAN/5/WWAN_RSSI_WEAK** log.	The value is a negative integer that ranges from -110 to -60, in dBm.

Views

System View

Default Level

2: Configuration Level

Usage Guidelines

Usage Scenario

You can run the **cellular log enable** command to enable the WWAN log function and view the 3G signal strength change in WWAN logs. You can run the **cellular log rssi-threshold** command to configure the RSSI threshold used for determining the 3G signal strength. The device records the signal strength change in logs based on the RSSI threshold.

 Copyright © Huawei Technologies Co., Ltd.

Precautions

After enabling the WWAN log function using the **cellular log enable** command, run the **cellular log rssi-threshold** command to configure the device to record logs based on the configured RSSI threshold.

Example

Set the RSSI threshold of the 3G signal strength to -80 dBm.

```
<Huawei> system-view
[Huawei] cellular log enable
[Huawei] cellular log rssi-threshold 80
```

Related Topics

5.11.9 cellular log enable

5.11.11 cellular log sinr-threshold

Function

The **cellular log sinr-threshold** command sets the signal to interference plus noise ratio (SINR) threshold used to determine the LTE signal strength.

The **undo cellular log sinr-threshold** command restores the default SINR threshold used to determine the LTE signal strength.

By default, the SINR threshold used to determine the LTE signal strength is 10 dB.

Format

cellular log sinr-threshold *sinr-threshold*

undo cellular log sinr-threshold

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
sinr-threshold	Sets the SINR threshold used to determine the LTE signal strength. • If the strength of received LTE signals is greater than the SINR threshold 10 consecutive times, and the signal strength becomes normal, the device records the **WWAN/5/WWAN_SINR_NORMAL** log. • If the strength of received LTE signals is not greater than the SINR threshold 10 consecutive times, and the signal strength becomes weak, the device records the **WWAN/5/WWAN_SINR_WEAK** log.	The value is an integer that ranges from 0 to 30, in dB.

Views

System view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

To check the LTE signal strength change in logs, run the **cellular log enable** command to enable the WWAN log function first. You can then run the **cellular log sinr-threshold** command to set the SINR threshold used to determine the LTE signal strength. The device then records signal strength change logs based on the configured threshold.

Precautions

 Copyright © Huawei Technologies Co., Ltd.

After the WWAN log function is enabled using the **cellular log enable** command, the device records logs based on the SINR threshold configured using the **cellular log sinr-threshold** command.

Example

Set the SINR threshold used to determine the LTE signal strength to 15 dB.

```
<Huawei> system-view
[Huawei] cellular log enable
[Huawei] cellular log sinr-threshold 15
```

Related Topics

5.11.9 cellular log enable

5.11.12 dialer mode ppp

Function

The **dialer mode ppp** command configures the PPP dial-up mode for the LTE modem to connect to a 3G or an LTE network.

The **undo dialer mode** command restores the default dial-up mode for the LTE modem to connect to a 3G or an LTE network.

By default, the LTE modem uses the standard interface defined in the network diver interface specification to connect to a 3G or an LTE network.

NOTE

Only routers with the built-in ME906E and ME909s-120 modules support this command.

Format

dialer mode ppp

undo dialer mode

Parameters

None

Views

Cellular interface view

Default Level

2: Configuration level

Usage Guidelines

By default, the LTE modem uses the standard interface defined in the network diver interface specification to connect to a 3G or an LTE network. If the carrier's

 Copyright © Huawei Technologies Co., Ltd.

device only supports the PPP dial-up mode for 3G/LTE network access, you must run the **dialer mode ppp** command to set the dial-up mode to PPP.

Example

Configure the PPP dial-up mode for the LTE modem to connect to a 3G or an LTE network.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] dialer mode ppp
modem reboot for changing modem dialer mode
```

5.11.13 dialer timer probe-interval

Function

The **dialer timer probe-interval** command sets the NQA probe interval for a cellular interface or cellular channel interface.

The **undo dialer timer probe-interval** command restores the default NQA probe interval.

By default, the NQA probe interval of a cellular interface or cellular channel interface is 60 seconds.

Format

dialer timer probe-interval *interval*

undo dialer timer probe-interval

Parameters

Parameter	Description	Value
interval	Specifies the NQA probe interval for a cellular interface or cellular channel interface.	The value is an integer that ranges from 1 to 60, in seconds.

Views

Cellular interface view, Cellular channel interface view

Default Level

2: Configuration level

Usage Guidelines

You are advised to set the NQA probe interval to be the same as the interval for automatically performing an NQA test instance. The later interval is set using the **frequency** command.

Copyright © Huawei Technologies Co., Ltd.

Example

Set the NQA probe interval of a cellular interface to 50 seconds.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] dialer enable-circular
[Huawei-Cellular0/0/0] dialer timer probe-interval 50
```

Related Topics

5.11.3 apn-profile

5.11.14 dialer-number (APN view)

Function

The **dialer-number** command configures a dialer number for the APN to dial up the remote device.

The **undo dialer-number** command deletes the dialer number for the APN to dial up the remote device.

By default, the dialer number for dialing up the remote device is not configured.

Format

dialer-number *dial-number*

undo dialer-number *dial-number*

Parameters

Parameter	Description	Value
dial-number	Specifies the dialer number.	The value is a string of 1 to 32 case-insensitive characters.

Views

APN view

Default Level

2: Configuration level

Usage Guidelines

When a device performs LTE dialup and the APN needs to dial up a destination address, you can run the dialer-number command to configure a dialer number.

Copyright © Huawei Technologies Co., Ltd.

Example

Create a dialer number for an APN.

```
<Huawei> system-view
[Huawei] apn profile me906
[Huawei-apn-profile-me906] dialer-number *99#
```

5.11.15 display apn-profile configuration

Function

The **display apn-profile configuration** command displays the APN profile configurations.

Format

display apn-profile configuration [*apn-profile-number*]

Parameters

Parameter	Description	Value
apn-profile-number	Specifies the number of APN profiles. • If this parameter is specified, the APN profile configurations are displayed according to the sequence in which the APN profiles are configured. • If this parameter is not specified, the configurations of all APN profiles are displayed.	The value is an integer that ranges from 1 to 128.

Views

All views

Default Level

2: Configuration level

Usage Guidelines

You can run this command to check the configurations of the existing APN profiles on the device.

Copyright © Huawei Technologies Co., Ltd.

Example

Display configurations of all APN profiles.

```
<Huawei> display apn-profile configuration
--------------------------------------------------------------------------------
profile-name       :unicom
apn              :ltenet1
user-name          :user1
authentication-mode:chap
sim-id             :1
--------------------------------------------------------------------------------
profile-name       :telcom
apn              :ltenet2
user-name          :user2
authentication-mode:auto
sim-id             :2
```

Table 5-35 Description of the display apn-profile configuration command output

Item	Description
profile-name	Name of an APN profile. To create an APN profile and enter the APN profile view, run the **apn profile** command.
apn	Name of an APN. To configure an APN in the APN profile, run the **apn** command.
user-name	User name for accessing an external PDN network. To configure the user name for accessing an external PDN network, run the **user** command.
authentication-mode	Authentication mode for accessing an external PDN network. • **auto**: PAP or CHAP authentication • **pap**: PAP authentication • **chap**: CHAP authentication To configure the authentication mode for accessing an external PDN network, run the **user** command and specify the **authentication-mode** parameter. When the **authentication-mode** parameter is not specified, the **auto** mode is used by default.
sim-id	ID of a SIM card. To configure a SIM card ID in the APN profile, run the **sim-id** command. **NOTE** The dual-SIM functions can be configured only on the LTE cellular interface (Cellular 0/0/0) supported by the AR109GW-L, AR121GW-L, AR129GW-L, AR129CGVW-L, AR161FG-Lc, AR161FG-L, AR169FGW-L, AR169FGVW-L, AR169G-L, AR169EGW-L, AR161G-L, AR161G-Lc, AR161FGW-La, AR161FGW-Lc, and AR161FGW-L.

Copyright © Huawei Technologies Co., Ltd.

Related Topics

5.11.2 apn profile
5.11.1 apn
5.11.67 user
5.11.56 sim-id

5.11.16 diagnostics-monitor-port on

Function

The **diagnostics-monitor-port on** command enables the MiniUSB interface on the 3G/LTE card.

The **undo diagnostics-monitor-port on** command disables the MiniUSB interface on the 3G/LTE card.

By default, the MiniUSB interface on the 3G/LTE card is disabled.

Format

diagnostics-monitor-port on

undo diagnostics-monitor-port on

Parameters

None

Views

Cellular interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

After the **diagnostics-monitor-port on** command enables the MiniUSB interface on the 3G/LTE card, you can use the PC to implement Internet access through dialup or upgrade the 3G/LTE module. The PC can connect to the MiniUSB interface on the 3G/LTE card through the USB line.

Precautions

- The original 3G/LTE service is interrupted after the **diagnostics-monitor-port on** command is run.
- The firmware version of the 3G/LTE modem cannot be upgraded after the **diagnostics-monitor-port on** command is run.
- If the device or 3G/LTE card is reset, the **diagnostics-monitor-port on** command cannot take effect. You must reconfigure the command.

 Copyright © Huawei Technologies Co., Ltd.

Example

Enable the MiniUSB interface on the 3G/LTE card.

```
<Huawei> system-view
[Huawei] interface cellular 1/0/0
[Huawei-Cellular1/0/0] diagnostics-monitor-port on
```

5.11.17 display cellular

Function

The **display cellular** command displays information about call sessions on a 3G or an LTE modem.

Format

display cellular *interface-number* { **all** | **hardware** | **security** | **network** | **profile** | **radio** }

Parameters

Parameter	Description	Value
interface-number	Specifies the number of a cellular interface or cellular channel interface.	-
all	Displays all information about call sessions on a 3G or an LTE modem. The information involves hardware, parameter description profile, network, radio, and security.	-
hardware	Displays hardware information about a 3G or an LTE modem.	-
security	Displays security information about a 3G or an LTE modem.	-
network	Displays network information about a 3G or an LTE modem.	-
profile	Displays parameter profile information about a 3G or an LTE modem.	-

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
radio	Displays radio information about a 3G or an LTE modem.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

The **display cellular** command displays information about call sessions on a 3G or an LTE modem, including the 3G or LTE modem's hardware information, parameter profile information, network information, radio information, security information or all the preceding information.

Example

Display all information about call sessions on a 3G modem.

```
<Huawei> display cellular 0/0/0 all
Modem State:
Hardware Information.
======================
Model = E372
Modem Type = WCDMA modem
Modem Firmware Version = 11.870.02.10.11
Hardware Version = CP12TCPU
Integrate circuit card identity (ICCID) = 98681011274300909893
International Mobile Subscriber Identity (IMSI) = 460016002707237
Mobile Station International ISDN Number (MSISDN) = 86013987654321
International Mobile Equipment Identity (IMEI) = 354661034412719
Factory Serial Number (FSN) = MLA7NA1093003693
Modem Status = Online
Profile Information.
====================
Profile 1 = ACTIVE
--------
PDP Type = IPv4, Header Compression = OFF
Data Compression = OFF
Access Point Name (APN) = 3GNET
Packet Session Status = Active
* - Default profile
Network Information.
====================
Current Service Status = Service available
Service Domain = Combined
Current Service = Combined
Packet Service = Attached
Packet Session Status = Active
Current Roaming Status = Home
Network Selection Mode = Automatic
Network Connection Mode = WCDMA precedence
Current Network Connection = WCDMA(WCDMA)
Mobile Country Code (MCC) = 460
```

 Copyright © Huawei Technologies Co., Ltd.

```
Mobile Network Code (MNC) = 01
Mobile Operator Information = "CHN-CUGSM"
Location Area Code (LAC) = 53505
Cell ID = 6012
Upstream Bandwidth = 54kbps
Downstream Bandwidth = 384kbps
Radio Information.
==================
Current Bands : AUTO
Current RSSI = -55 dBm (good)

Modem Security Information.
==========================
SIM ID = 1
PIN Verification = Disabled
PIN Status = Ready
Number of Retries remaining = 3
SIM Status = OK
```

Display all information about call sessions (connected to the LTE network) on an LTE modem.

```
<Huawei> display cellular 0/0/0 all
Modem State:
Hardware Information.
=====================
Model = ME906E
Modem Type = LTE module
Modem Firmware Version =  11.833.15.00.000
Hardware Version = CD2E392UM
Integrate circuit card identity (ICCID) = 98681011274300909893
International Mobile Subscriber Identity (IMSI) = 460016002731442
Mobile Station International ISDN Number (MSISDN) = 86013987654321
International Mobile Equipment Identity (IMEI) = 861230010006485
Factory Serial Number (FSN) = T2Y01A9211900298
Modem Status = Online
Profile Information.
====================
Profile 1 = ACTIVE
--------
PDP Type = IPv4, Header Compression = OFF
Data Compression = OFF
Access Point Name (APN) = LTENET
Packet Session Status = Active
* - Default profile
Network Information.
====================
Current Service Status = Service available
Service Domain = Combined
Current Service = Combined
Packet Service = Attached
Packet Session Status = Active
Current Roaming Status = Home
Network Selection Mode = Automatic
Network Connection Mode =  LTE only
Current Network Connection = LTE(LTE)
Mobile Country Code (MCC) = 460
Mobile Network Code (MNC) = 07
Mobile Operator Information = CHINA  MOBILE
Cell ID = 55924
Upstream Bandwidth = 50mbps
Downstream Bandwidth = 100mbps
Radio Information.
==================
Current Bands :
  GSM: GSM1800
  WCDMA: AUTO
  LTE: AUTO
Current RSSI = -55 dBm
Current RSRP = -86 dBm (strong)
```

 Copyright © Huawei Technologies Co., Ltd.

```
Current RSRQ = -6 dB
Current SINR = 29 dB
Bands supported :
  GSM: GSM850 GSM900 GSM1800 GSM1900
  WCDMA: WCDMA850 WCDMA900 WCDMA2100 WCDMA1900
  LTE: LTE900 LTE2100
Modem Security Information.
==========================
SIM ID = 1
PIN Verification = Disabled
PIN Status = Ready
Number of Retries remaining = 3
SIM Status = OK
```

Display all information about call sessions (connected to the WCDMA network) on an LTE modem.

```
<Huawei> display cellular 0/0/0 all
Modem State:
Hardware Information.
====================
Model = ME906E
Modem Type = LTE module
Modem Firmware Version =  11.833.15.00.000
Hardware Version = CD2E392UM
Integrate circuit card identity (ICCID) = 98681011274300909893
International Mobile Subscriber Identity (IMSI) = 460016002731442
Mobile Station International ISDN Number (MSISDN) = 86013987654321
International Mobile Equipment Identity (IMEI) = 861230010006485
Factory Serial Number (FSN) = T2Y01A9211900298
Modem Status = Online
Profile Information.
====================
Profile 1 = ACTIVE
--------
PDP Type = IPv4, Header Compression = OFF
Data Compression = OFF
Access Point Name (APN) = LTENET
Packet Session Status = Active
* - Default profile
Network Information.
====================
Current Service Status = Service available
Service Domain = PS-only
Current Service =  PS
Packet Service = Attached
Packet Session Status = Active
Current Roaming Status = Home
Network Selection Mode = Automatic
Network Connection Mode = WCDMA only
Current Network Connection = WCDMA(WCDMA)
Mobile Country Code (MCC) = 460
Mobile Network Code (MNC) = 07
Mobile Operator Information = CHINA  MOBILE
Location Area Code (LAC) = 53515
Cell ID = 55924
Upstream Bandwidth = 50kbps
Downstream Bandwidth = 384kbps
Radio Information.
==================
Current Bands :
  GSM: GSM1800
  WCDMA: AUTO
  LTE: AUTO
Current RSSI = -55 dBm (good)
Current RSCP = -47 dBm
Current ECIO = 0 dB
Bands supported :
  GSM: GSM850 GSM900 GSM1800 GSM1900
  WCDMA: WCDMA850 WCDMA900 WCDMA2100 WCDMA1900
```

 Copyright © Huawei Technologies Co., Ltd.

```
  LTE: LTE900 LTE2100
Modem Security Information.
============================
SIM ID = 1
PIN Verification = Disabled
PIN Status = Ready
Number of Retries remaining = 3
SIM Status = OK
```

Display network information about a 3G or an LTE modem.

```
<Huawei> display cellular 0/0/0 network
Modem State:
Network Information.
====================
Current Service Status = Service available
Service Domain = Combined
Current Service = Combined
Packet Service = Attached
Packet Session Status = Inactive
Current Roaming Status = Home
Network Selection Mode = Automatic
Network Connection Mode = WCDMA precedence
Current Network Connection = WCDMA(WCDMA)
Mobile Country Code (MCC) = 460
Mobile Network Code (MNC) = 01
Mobile Operator Information = CHN-UNICOM
Location Area Code (LAC) = 53515
Cell ID = 55924
Upstream Bandwidth = 54kbps
Downstream Bandwidth = 384kbps
```

Table 5-36 Description of the **display cellular** command output

Item	Description
Modem State	Status of the 3G or LTE modem.
Hardware Information	Information about the 3G or LTE modem hardware.
Model	Model of the 3G or LTE modem.
Modem Type	Modular type of the 3G or LTE modem. The displayed modular type consists of the modular standard type and modular physical type. The modular standard types are as follows: • WCDMA: indicates the WCDMA standard. • CDMA2000: indicates the CDMA2000 standard. • LTE: indicates the LTE standard.
Modem Firmware Version	Firmware version of the 3G or LTE modem.
Hardware Version	Hardware version of the 3G or LTE modem.
Integrate circuit card identity (ICCID)	Integrate circuit card identity of the 3G or LTE modem.
International Mobile Subscriber Identity (IMSI)	International Mobile Subscriber Identity (IMSI) allocated to the user.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Mobile Station International ISDN Number (MSISDN)	Mobile Station International ISDN Number (MSISDN).
International Mobile Equipment Identity (IMEI)	International Mobile Equipment Identity (IMEI) of the 3G or LTE modem.
Factory Serial Number (FSN)	Factory serial number (FSN) of the 3G or LTE modem.
Modem Status	Whether the 3G or LTE modem is online: • Online: indicates that the modem is online. • Offline: indicates that the modem is offline.
Profile Information	Information about the parameter profile configured for the 3G or LTE modem.
Profile 1	Status of profile 1: • Active: indicate the active status. • Inactive: indicate the inactive status.
PDP Type	Packet data protocol (PDP) type: • IPv4: indicates IPv4 packets. • PPP: indicates PPP packets.
Header Compression	Whether IP header compression is enabled: • On: IP header compression is enabled. • OFF: IP header compression is disabled.
Data Compression	Whether IP packet data compression is enabled: • On: IP packet data compression is enabled. • OFF: IP packet data compression is disabled.
Access Point Name (APN)	APN that the carrier allocated to the 3G or LTE modem. To set an APN, run the **apn** command in the APN profile view.
Packet Session Status	Session status: • Active: indicates that data is transmitted properly. • Inactive: indicates that data transmission is interrupted.
Default profile	Default parameter profile, profile 1.
Network Information	Information about the network connected to the 3G or LTE modem.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
Current Service Status	Service status of the 3G or LTE modem: • Service available: The 3G or LTE modem is providing services. • No service: No service is available on the 3G or LTE modem. • Emergency: The 3G or LTE modem provides services only for emergency use. • Region emergency: The 3G or LTE modem provides services only for emergency use in a region. • Saving status: The 3G or LTE modem is working in power-saving mode.
Service Domain	Configured PS or CS domain: • PS-only: The modem works only in the PS domain. • Combined: The modem works in both the CS domain and PS domain. This parameter can be configured using the **service domain** command.
Current Service	Service type: • CS: Only the circuit switching (CS) service is available. • PS: Only the packet switching (PS) service is available. • Combined: Both the PS and CS services are available. • Not support CDMA: CDMA does not support the service. • Invalid: Neither the CS service nor the PS service has been registered.
Packet Service	Relationship between the 3G or LTE modem and the PS domain: • Attached: The 3G or LTE modem is attached to the PS domain. • Detached: The 3G or LTE modem is detached from the PS domain.
Current Roaming Status	Roaming status of the user: • Home: The user is in the home location. • Roaming: The user is roaming.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
Network Selection Mode	Method used to select a public land mobile network (PLMN): • Automatic: indicates automatic network selection. • Manual: indicates manual network selection. This parameter can be configured using the **plmn select** command.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
Network Connection Mode	Connection mode that the 3G modem used on a WCDMA or CDMA network, or connection mode that the LTE modem used on an LTE network. The following connection modes are available for a WCDMA network: • GSM only: Only the GSM mode can be used. • GSM precedence: The GSM mode is used preferentially. • WCDMA only: Only the WCDMA mode can be used. • WCDMA precedence: The WCDMA mode is used preferentially. This parameter can be configured using the **mode wcdma** command. The following connection modes are available for a CDMA network: • 1xrtt only: Only the CDMA2000 1X (1xRTT) mode can be used. • Evdo only: Only the CDMA2000 1xEV-DO mode can be used. • HYBRID: The CDMA2000 1X and CDMA2000 1xEV-DO combined mode can be used. This parameter can be configured using the **mode cdma** command. The following connection modes are available for an LTE network: • Automatic: indicates that the LTE modem automatically selects a network. • GSM only: indicates that the LTE modem can only select the GSM network. • WCDMA only: indicates that the LTE modem can only select the WCDMA network. • LTE only: indicates that the LTE modem can only select the LTE network. • UMTS only: indicates that the LTE modem selects the WCDMA or TD-SCDMA network. • WCDMA-GSM: indicates that the LTE modem selects the WCDMA or GSM network. The WCDMA mode is used preferentially. • UMTS-GSM: indicates that the LTE modem selects the UMTS or GSM network. The UMTS mode is used preferentially. This parameter can be configured using the **mode lte** command.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
Current Network Connection	Type of the network connected to the 3G or LTE modem.
Mobile Country Code (MCC)	Mobile country code of the network. This parameter can be configured using the **plmn select** command.
Mobile Network Code (MNC)	Mobile network code of the network. This parameter can be configured using the **plmn select** command.
Mobile Operator Information	Carrier information.
Location Area Code (LAC)	Location area code of the network.
Cell ID	Cell ID of the network.
Upstream Bandwidth	Upstream bandwidth of the 3G or LTE modem.
Downstream Bandwidth	Downstream bandwidth of the 3G or LTE modem.
Radio Information	Information about the radio used by the 3G or LTE modem.
Current Bands	Frequency band used by the 3G or LTE modem. The option **AUTO** indicates that the 3G or LTE modem automatically selects the frequency band of the carrier network to be connected to. To set the frequency band, run the **band gsm**, **band wcdma** or **band lte** command.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Current RSSI	Received signal strength indicator. On a WCDMA network, the relationship between the signal strength and RSSI is as follows: ● good: The RSSI is higher than or equal to -70 dBm. ● normal: The RSSI is higher than -85 dBm and lower than -70 dBm. ● weak: The RSSI is higher than -113 dBm and lower than or equal to -85 dBm. ● no service: The RSSI is lower than or equal to -113 dBm. On a CDMA2000 network, the relationship between the signal strength and RSSI is as follows: ● good: The RSSI is higher than or equal to -80 dBm. ● normal: The RSSI is higher than -90 dBm and lower than -80 dBm. ● weak: The RSSI is higher than -125 dBm and lower than or equal to -90 dBm. ● no service: The RSSI is lower than or equal to -125 dBm.
Current RSRP	Reference signal received power. On a 4G/LTE network, the relationship between the signal strength and RSRP is as follows: ● strong: The RSRP is higher than or equal to -90 dBm. ● good: The RSRP is higher than -105 dBm and lower than or equal to -90 dBm. ● normal: The RSRP is higher than -112 dBm and lower than or equal to -105 dBm. ● slow: The RSRP is higher than -125 dBm and lower than or equal to -112 dBm. ● weak: The RSRP is higher than -136 dBm and lower than or equal to -125 dBm. ● no service: The RSRP is lower than or equal to -136 dBm.
Current RSRQ	Reference signal received quality.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
Current SINR	Signal to interference plus noise ratio. By default, the SINR threshold is used for the LTE signal strength The relationship between the signal strength and SINR is as follows: • good: The SINR is higher than or equal to 15 dB. • normal: The SINR is higher than 10 dB and lower than 15 dB. • weak: The SINR is lower than or equal to 10 dB and is higher than or equal to -20 dB. • no service: The SINR is lower than -20 dB.
Current RSCP	Received signal code power.
Current ECIO	Energy per chip to interference of other cell ratio.
Bands supported	Frequency band supported by the 3G or LTE modem.
Modem Security Information.	3G or LTE modem's security information.
SIM ID	The ID of SIM card.
PIN Verification	Whether PIN authentication is enabled: • Enabled: PIN authentication is enabled. • Disabled: PIN authentication is disabled. This parameter can be configured using the **pin verification** command.
PIN Status	Status of the PIN: • Unknown: indicates that the status of PIN authentication is unknown. • Ready: indicates that the PIN is unlocked successfully. • PIN Requirement: indicates that users need to enter the PIN for authentication. • PUK Requirement: indicates that users need to enter the PUK to unlock the PIN.
Number of Retries remaining	Number of PIN authentication attempts allowed. By default, the PIN is locked after the user enters incorrect PINs consecutively 3 times.
SIM Status	Status of the SIM card: • Invalid: indicates that the SIM card is not functioning properly for some reason. For example, the PIN is not unlocked. • Not insert: indicates that the SIM card is not installed. • OK: indicates that the SIM card works normally.

 Copyright © Huawei Technologies Co., Ltd.

Related Topics

5.11.46 profile create
5.11.45 plmn select
5.11.29 mode wcdma
5.11.27 mode cdma
5.11.42 pin verification

5.11.18 display interface cellular

Function

The **display interface cellular** command displays the status of and traffic statistics on a cellular interface or cellular channel interface.

Format

display interface cellular [*interface-number*]

Parameters

Parameter	Description	Value
interface-number	Specifies the number of a cellular interface or cellular channel interface. If this parameter is not specified, the status of and traffic statistics on all cellular interfaces or cellular channel interfaces are displayed.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

The **display interface cellular** command displays the status of and traffic statistics on a cellular interface or cellular channel interface. You can collect traffic statistics and locate faults on the serial interface according to the command output.

Copyright © Huawei Technologies Co., Ltd.

Example

Display the status of and traffic statistics on cellular interface 0/0/0.

```
<Huawei> display interface cellular 0/0/0
Cellular0/0/0 current state : UP
Line protocol current state : UP
Description:HUAWEI, AR Series, Cellular0/0/0 Interface
Route Port,The Maximum Transmit Unit is 1500, Hold timer is 10(sec)
Internet Address is negotiated, 10.1.1.2/24
Link layer protocol is PPP
LCP opened, IPCP opened
Current system time: 2011-06-08 11:35:23
Modem State: Present
Model = ME906E
Current Network Connection = LTE(LTE)
Current RSSI = -91 dBm
Current SINR = 6 dB (weak)
Last 300 seconds input rate 555 bytes/sec 4440 bits/sec 12 packets/sec
Last 300 seconds output rate 11230 bytes/sec 89840 bits/sec 311 packets/sec
   Input: 210 packets, 87205 bytes
     Unicast:              200,      Ununicast:              10
   Output:225340 packets, 6760917 bytes
     Unicast:              225300,   Ununicast:              40
   Input bandwidth utilization  : 0.01%
   Output bandwidth utilization : 0.01%
```

Table 5-37 Description of the **display interface cellular** command output

Item	Description
Cellular0/0/0 current state	Status of the cellular interface: • UP: The interface is physically Up. • DOWN: The interface is physically Down. • Administratively down: The administrator has run the **shutdown** command on the interface.
Line protocol current state	Link layer protocol status of the cellular interface: • UP: The link layer protocol of the interface is Up. • DOWN: The link layer protocol status of the interface is Down or no IP address is assigned to the interface.
Description	Interface description.
The Maximum Transmit Unit is	Maximum Transmission Unit (MTU) of the interface. Run the **5.20.8 mtu** command to set the maximum transmission unit (MTU) of an interface.
Hold timer is 10(sec)	Lifecycle of a packet. If a packet is not sent out before the hold timer times out, the packet is discarded.
Internet Address	IP address of the cellular interface. If no IP address is assigned to the interface, the system displays "Internet protocol processing : disabled".
Link layer protocol	Link layer protocol used by the cellular interface.
LCP opened	Status of the Link Control Protocol (LCP).

Copyright © Huawei Technologies Co., Ltd.

Item	Description
IPCP opened	Internet Protocol Control Protocol (IPCP) status of the MP link.
Current system time	Current system time. If the time zone is configured and the daylight saving time is used, the time is in YYYY-MM-DD HH:MM:SS UTC±HH:MM DST format.
Modem State	Whether a 3G or LTE modem has been connected to the cellular interface.
Model	Model of the 3G or LTE modem.
Current Network Connection	Type of the network connected to the 3G or LTE modem.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Current RSSI/RSRP	Received signal strength indicator or reference signal receiving power. On a WCDMA network, the relationship between the signal strength and RSSI is as follows: ● good: The RSSI is higher than or equal to -70 dBm. ● normal: The RSSI is higher than -85 dBm and lower than -70 dBm. ● weak: The RSSI is higher than -113 dBm and lower than or equal to -85 dBm. ● no service: The RSSI is lower than or equal to -113 dBm. On a CDMA2000 network, the relationship between the signal strength and RSSI is as follows: ● good: The RSSI is higher than or equal to -80 dBm. ● normal: The RSSI is higher than -90 dBm and lower than -80 dBm. ● weak: The RSSI is higher than -125 dBm and lower than or equal to -90 dBm. ● no service: The RSSI is lower than or equal to -125 dBm. On a 4G/LTE network, the relationship between the signal strength and RSRP is as follows: ● strong: The RSRP is higher than or equal to -90 dBm. ● good: The RSRP is higher than -105 dBm and lower than or equal to -90 dBm. ● normal: The RSRP is higher than -112 dBm and lower than or equal to -105 dBm. ● slow: The RSRP is higher than -125 dBm and lower than or equal to -112 dBm. ● weak: The RSRP is higher than -136 dBm and lower than or equal to -125 dBm. ● no service: The RSRP is lower than or equal to -136 dBm.
Current SINR	Signal to interference plus noise ratio. By default, the SINR threshold is used for the LTE signal strength The relationship between the signal strength and SINR is as follows: ● good: The SINR is higher than or equal to 15 dB. ● normal: The SINR is higher than 10 dB and lower than 15 dB. ● weak: The SINR is lower than or equal to 10 dB and is higher than or equal to -20 dB. ● no service: The SINR is lower than -20 dB.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Last 300 seconds input rate	Incoming packet rate (bits per second and packets per second) within the last 300 seconds.
Last 300 seconds output rate	Outgoing packet rate (bits per second and packets per second) within the last 300 seconds.
Input	Number of packets received by the cellular interface.
Output	Number of packets sent by the cellular interface.
Unicast	Number of unicast packets received or sent by the cellular interface.
Ununicast	Number of non-unicast packets received or sent by the cellular interface.
Input bandwidth utilization	Inbound bandwidth usage.
Output bandwidth utilization	Outbound bandwidth usage.

5.11.19 display cellular feature

Function

The **display cellular feature** command displays the status of the source address verification, LTE QoS flow control, and DHCP transparent transmission functions of the modem.

NOTE

Only routers with built-in ME909s modules support this command.

Format

display cellular *interface-number* **feature**

Parameters

Parameter	Description	Value
interface-number	Displays the status of the source address verification, LTE QoS flow control, and DHCP transparent transmission functions of the modem on a specified interface.	-

Views

All views

Copyright © Huawei Technologies Co., Ltd.

Default Level

1: Monitoring level

Usage Guidelines

You can run the **display cellular feature** command to check the status of the source address verification, LTE QoS flow control, and DHCP transparent transmission functions of the modem. If the modem's firmware version is correct, the status of source address verification function is disabled, and the status of the LTE QoS flow control and DHCP transparent transmission functions is enabled according to customization. If the modem feature status does not meet the customized status, run the **module-upgrade** command in the diagnostic view to upgrade the modem version.

Example

Display the status of the source address verification, LTE QoS flow control, and DHCP transparent transmission functions of the modem on Cellular0/0/0.

```
<Huawei> display Cellular 0/0/0 feature
Modem feature status:
  Source address check: disabled
  LTE QoS control: enabled
  DHCP transfer packet: enabled
  Audio optimize: enabled
  Discontinuous Reception: disabled
  Encryption algorithm: gea1 gea2
  Modem log status: locked
```

Table 5-38 Description of the **display cellular feature** command output

Item	Description
Modem feature status	Status of the source address verification, LTE QoS flow control, and DHCP transparent transmission functions of the modem.
Source address check	Status of source MAC address verification.
LTE QoS control	Status of the LTE QoS flow control feature.
DHCP transfer packet	Status of the DHCP transparent transmission function.
Audio optimize	Status of the audio optimization function.
Discontinuous Reception	Status of the Discontinuous Reception (DRX) function.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Encryption algorithm	GPRS encryption algorithm supported by the 3G/LTE modem. You can run the **modem encryption-algorithm** command to change the GPRS encryption algorithm.
Modem log status	Log status of the current modem: • locked: The modem is locked. • unlocked: The modem is unlocked. **NOTE** Only V200R010C10 and later versions support this command.

5.11.20 display sms interface cellular

Function

The **display sms interface cellular** command displays information about received SMS messages.

Format

display sms interface cellular *interface-number* { **brief** | **id** *sms-id* | **verbose** }

Parameters

Parameter	Description	Value
interface-number	Specifies the number of a cellular interface or cellular channel interface.	-
brief	Displays brief information about all SMS messages.	-
id *sms-id*	Displays information about the SMS message with a specified ID. *sms-id* specifies the SMS message ID.	The value is an integer that ranges from 0 to 255.
verbose	Displays detailed information about all SMS messages.	-

Copyright © Huawei Technologies Co., Ltd.

Views

All views

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

You can run this command to view information about SMS messages received by the device, including the source number, sending date and time, and size of the messages.

Example

Display brief information about all SMS messages received by Cellular2/0/0.

```
<Huawei> display sms interface cellular 2/0/0 brief
  ID   FROM         DATE      TIME      SIZE
   1  ****1111  13/02/14  10:38:36    20
   2  ****2222  13/02/14  15:40:41     5
   3  ****3333  13/02/14  16:19:04     6
 USED: 3  TOTAL: 3
```

Display detailed information about all SMS messages received by Cellular2/0/0.

```
<Huawei> display sms interface cellular 2/0/0 verbose
[ ID:  1 TIME: 13/02/14 10:38:36 FROM: ****1111 ]
[ ID:  2 TIME: 13/02/14 15:40:41 FROM: ****2222 ]
[ ID:  3 TIME: 13/02/14 16:19:04 FROM: ****3333 ]
```

Display information about the SMS message with the ID 1 received by Cellular2/0/0.

```
<Huawei> display sms interface cellular 2/0/0 id 1
ID:  1
FROM: ****1111
DATE: 13/02/14
TIME: 10:38:36
SIZE: 20
```

Table 5-39 Description of the **display sms interface cellular** command output

Item	Description
ID	ID of a received SMS message.
FROM	Source number of a received SMS message.
DATE	Date when an SMS message is received.
TIME	Time when an SMS message is received.
SIZE	Size of a received SMS message.

Copyright © Huawei Technologies Co., Ltd.

5.11.21 display sms interface cellular statistics

Function

The **display sms interface cellular statistics** command displays statistics about SMS messages.

Format

display sms interface cellular *interface-number* **statistics**

Parameters

Parameter	Description	Value
interface-number	Specifies the number of a cellular interface or cellular channel interface.	-

Views

All views

Default Level

2: Configuration level

Usage Guidelines

You can run this command to check statistics about SMS messages, including the number of received SMS messages, number of SMS messages sent successfully, number of SMS messages failed to be sent, and number of deleted SMS messages.

Example

Display statistics about SMS messages received or sent by Cellular2/0/0.

```
<Huawei> display sms interface cellular 2/0/0 statistics
Total SMS received = 8
Total SMS sent successfully = 3
Total SMS sent failure = 0
Total SMS deleted = 3
```

Table 5-40 Description of the **display sms interface cellular statistics** command output

Item	Description
Total SMS received	Number of received SMS messages.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Total SMS sent successfully	Number of SMS messages sent successfully.
Total SMS sent failure	Number of SMS messages failed to be sent.
Total SMS deleted	Number of deleted SMS messages.

5.11.22 display sms send-history

Function

The **display sms send-history** command displays records of sent short messages saved in the memory.

Format

display sms send-history

Parameters

None

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

Usage Scenario

You can run this command to check records of sent short messages.

Precautions

A maximum of 20 records of recently sent short messages can be displayed. The new record overrides the old ones.

After the device restarts, the historical records of sent short messages disappear.

Example

Display records of sent short messages saved in the memory.

```
<Huawei> display sms send-history
ID RECEIVER          YYYY/MM/DD  HH:MM:SS    INTERFACE        RESULT
0  ****5678          2015/03/04  17:15:54                     FAIL
```


Copyright © Huawei Technologies Co., Ltd.

Table 5-41 Description of the **display sms send-history** command output

Item	Description
ID	ID of a short message record. The ID ranges from 0 to 19.
RECEIVER	User phone number for receiving short messages. To configure the user phone number, run the **sms item** command.
YYYY/MM/DD	Date when short messages are sent.
HH:MM:SS	Time when short messages are sent.
INTERFACE	Cellular interface that successfully sends short messages.
RESULT	Result of sending short messages. • SUCCESS: indicates that short messages are sent successfully. • FAIL: indicates that short messages fail to be sent. • UNSENT: indicates that all cellular interfaces cannot send short messages. • INVALID: indicates that the SMS service referenced by the **sms send-item** command does not exist. Short messages cannot be sent.

Related Topics

5.11.63 sms item

5.11.23 display snmp-agent trap feature-name ifmtrap all

Function

The **display snmp-agent trap feature-name ifmtrap all** command displays the status of all traps on the IFM module.

Format

display snmp-agent trap feature-name ifmtrap all

Parameters

None

Views

All views

Copyright © Huawei Technologies Co., Ltd.

Default Level

1: Monitoring level

Usage Guidelines

You can run the **display snmp-agent trap feature-name ifmtrap all** command to check the status of all traps on the IFM module. The status of a trap is configured using the **snmp-agent trap enable feature-name ifmtrap** command.

Example

Display the status of all traps on the IFM module.

```
<Huawei> display snmp-agent trap feature-name ifmtrap all
------------------------------------------------------------------------------
Feature name: IFMTRAP
Trap number : 5
------------------------------------------------------------------------------
Trap name                      Default switch status   Current switch status
hw3GPinModify                    on                      on
hwPortPhysicalEthHalfDuplexAlarm
                               off                     off
hwPortPhysicalEthFullDuplexClear
                               off                     off
hw3GMIBTrapCellIdChange        off                       off
hwPortSpeedChangeTrap          off                       off
```

Table 5-42 Description of the **display snmp-agent trap feature-name ifmtrap all** command output

Item	Description
Feature name	Name of the module to which a trap belongs.
Trap number	Number of traps.
Trap name	Name of a trap. Traps on the IFM module include: • hw3GPinModify: enables the trap function for the PIN change. • hwPortPhysicalEthHalfDuplexAlarm: enables the trap function for the interface duplex mode change from full-duplex to half-duplex. • hwPortPhysicalEthFullDuplexClear: enables the trap function for the interface duplex mode change from half-duplex to full-duplex. • hw3GMIBTrapCellIdChange: enables the trap function for the cell ID change. • hwPortSpeedChangeTrap: enables the trap function for the interface rate change.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
Default switch status	Default trap status: • on: indicates that the trap function is enabled by default. • off: indicates that the trap function is disabled by default.
Current switch status	Current trap status: • on: indicates that the trap function is enabled. • off: indicates that the trap function is disabled.

Related Topics

5.11.66 snmp-agent trap enable feature-name ifmtrap

5.11.24 imsi check

Function

The **imsi check** command enables IMSI check before LTE dialup.

The **undo imsi check** command disables IMSI check before LTE dialup.

By default, IMSI check before LTE dialup is disabled.

Format

imsi check *imsi*

undo imsi check

Parameters

Parameter	Description	Value
imsi	Specifies the IMSI of a SIM card.	The value is a string of 1 to 15 characters. It can only contain digits 0 to 9.

Views

LTE cellular interface view

Default Level

2: Configuration level

Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

To prevent a rogue SIM card from establishing a connection with the Agile Controller-Campus through LTE dialup, you can enable IMSI check before dialup to check whether the configured IMSI is the same as the IMSI of the current SIM card. If the IMSIs are the same, the device continues the dialup. If the IMSIs are different, the device does not trigger the dialup.

Example

Enable IMSI check before LTE dialup. The IMSI is 666.

```
<Huawei> system-view
[Huawei] interface Cellular 0/0/0
[Huawei-Cellular0/0/0] imsi check 666
```

Related Topics

5.11.4 apn user name catch-imsi-sn

5.11.25 interface cellular

Function

Using the **interface cellular** command, you can enter the cellular interface view or cellular channel interface view.

Format

interface cellular *interface-number*

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
interface-number	Specifies the number of a cellular interface or cellular channel interface. • To enter the cellular interface view, specify *interface-number* in the format of slot number/card number/interface number. • To enter the cellular channel interface view, specify *interface-number* in the format of chassis number/slot number/card number/main interface number:channel interface number (the value can be 1 or 2). For example, channel interface 1 of Cellular0/0/0 is numbered Cellular0/0/0:1.	-

Views

System view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

To configure the 3G or LTE function on a cellular interface or cellular channel interface, run the **interface cellular** command to enter the cellular interface view or cellular channel interface view.

Cellular channel interfaces only apply to the multi-APN scenario.

Prerequisites

The multi-APN function has been enabled on the cellular interface before you enter the cellular channel interface view.

 Copyright © Huawei Technologies Co., Ltd.

Example

Enter the view of cellular interface 0/0/0.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0]
```

Display the view of cellular channel interface 1.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] multi-apn enable
[Huawei-Cellular0/0/0] quit
[Huawei] interface cellular 0/0/0:1
[Huawei-Cellular0/0/0:1]
```

Related Topics

5.11.18 display interface cellular

5.11.38 multi-apn enable

5.11.26 ip address negotiate

Function

The **ip address negotiate** command enables a cellular interface or cellular channel interface to dynamically obtain an IP address.

The **undo ip address negotiate** command disables a cellular interface or cellular channel interface from dynamically obtaining an IP address.

By default, a cellular interface or cellular channel interface cannot dynamically obtain an IP address.

Format

ip address negotiate

undo ip address negotiate

Parameters

None

Views

Cellular interface view, Cellular channel interface view

Default Level

2: Configuration level

Usage Guidelines

You can run the **ip address negotiate** command to enable a cellular interface or cellular channel interface to dynamically obtain an IP address from the carrier.

 Copyright © Huawei Technologies Co., Ltd.

Example

Enable the cellular interface to dynamically obtain an IP address.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] ip address negotiate
```

5.11.27 mode cdma

Function

Using the **mode cdma** command, you can configure a CDMA2000 network connection mode for a 3G modem.

Format

mode cdma { **1xrtt-only** | **evdo-only** | **hybrid** }

Parameters

Parameter	Description	Value
1xrtt-only	Indicates that a 3G modem connects to a 1x radio transmission technology (1xRTT) network.	-
evdo-only	Indicates that a 3G modem connects to an evolution-data optimized (EV-DO) network.	-
hybrid	Indicates that a 3G modem connects to a 1xRTT and EV-DO combined network.	-

Views

Cellular interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The 3G modem has various types. By default, each type of the 3G modem has a unique CDMA2000 network connection mode. After a CDMA2000 network

 Copyright © Huawei Technologies Co., Ltd.

connection mode is configured, it is recorded in the 3G modem and permanently valid.

Configure a correct CDMA2000 network connection mode for the 3G modem based on the type of the network provided by the carrier. If the CDMA2000 network connection mode is incorrect, you need to run the **mode cdma** command to change the CDMA2000 network connection mode for the 3G modem.

Precautions

- This command is valid only when a 3G modem with a UIM card is connected to a 3G cellular interface.
- If you run the **mode cdma** command multiple times in the same 3G cellular interface view, only the latest configuration takes effect.

Example

Configure the 3G modem to connect to a 1xRTT and EV-DO combined network.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] mode cdma hybrid
```

Related Topics

5.11.29 mode wcdma

5.11.28 mode lte

Function

The **mode lte** command configures the 3G or LTE network connection mode for an LTE modem.

By default, the 3G or LTE network connection mode is auto for an LTE modem.

Format

mode lte { **auto** | **gsm-only** | **1xrtt-only** | **evdo-only** | **hybrid** | **lte-only** | **tdscdma-only** | **umts-gsm** | **umts-only** | **wcdma-gsm** | **wcdma-only** }

Parameters

Parameter	Description	Value
auto	Indicates that an LTE modem automatically connects to a network.	-
gsm-only	Indicates that an LTE modem can only connect to a GSM network.	-

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
1xrtt-only	Indicates that an LTE modem can only connect to a 1xRTT network. **NOTE** The 1LTE-Lt interface card support this parameter.	-
evdo-only	Indicates that an LTE modem can only connect to a EV-DO network. **NOTE** The 1LTE-Lt interface card and 1LTE-Lt-7 interface card support this parameter.	-
hybrid	Indicates that an LTE modem connects to a 1xRTT and EV-DO combined network. **NOTE** The 1LTE-Lt interface card support this parameter.	-
lte-only	Indicates that an LTE modem can only connect to a LTE network.	-
tdscdma-only	Indicates that an LTE modem can only connect to a TD-SCDMA network. **NOTE** The 1LTE-Lt and 1LTEC interface card support this parameter.	-
umts-gsm	Indicates that an LTE modem connects to either a UMTS or GSM network and preferentially connects to the UMTS network. **NOTE** The 1LTEC interface card and 1LTE-Lt-7 interface card supports this parameter.	-

 Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
umts-only	Indicates that an LTE modem can only connect to either a WCDMA or TD-SCDMA network. **NOTE** The 1LTEC interface card and 1LTE-Lt-7 interface card supports this parameter.	-
wcdma-gsm	Indicates that an LTE modem connects to either a WCDMA or GSM network and preferentially connects to the WCDMA network. **NOTE** The 1LTEC interface card and 1LTE-Lt-7 interface card does not support this parameter.	-
wcdma-only	Indicates that an LTE modem can only connect to a WCDMA network. **NOTE** The 1LTEC interface card and 1LTE-Lt-7 interface card does not support this parameter.	-

Views

Cellular interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

LTE cellular interfaces can connect to the 3G or LTE network only when the 3G or LTE network connection mode is configured for an LTE modem based on the type of the network provided by the carrier. If the connection mode is inconsistent with the network type, run the **mode lte** command to modify the 3G or LTE network connection mode for the LTE modem.

Precautions

 Copyright © Huawei Technologies Co., Ltd.

- This command is valid only when the LTE modem is working.
- If you run the **mode lte** command multiple times in the same LTE cellular interface view, only the latest configuration takes effect.

Example

Configure the LTE modem to select the LTE network.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] mode lte lte-only
```

5.11.29 mode wcdma

Function

Using the **mode wcdma** command, you can configure a WCDMA network connection mode for a 3G modem.

Format

mode wcdma { **gsm-only** | **gsm-precedence** | **wcdma-only** | **wcdma-precedence** }

Parameters

Parameter	Description	Value
gsm-only	Indicates that a 3G modem connects to a GSM network.	-
gsm-precedence	Indicates that a 3G modem preferentially connects to a GSM network.	-
wcdma-only	Indicates that a 3G modem connects to a WCDMA network.	-
wcdma-precedence	Indicates that a 3G modem preferentially connects to a WCDMA network.	-

Views

Cellular interface view

Default Level

2: Configuration level

Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

Usage Scenario

The 3G modem has various types. By default, each type of the 3G modem has a unique WCDMA network connection mode. After a WCDMA network connection mode is configured, it is recorded in the 3G modem and permanently valid.

Configure a correct WCDMA network connection mode for the 3G modem based on the type of the network provided by the carrier. If the WCDMA network connection mode is incorrect, you need to run the **mode wcdma** command to change the WCDMA network connection mode for the 3G modem.

Precautions

- This command is valid only when a 3G modem is connected to a 3G cellular interface.
- If you run the **mode wcdma** command multiple times in the same 3G cellular interface view, only the latest configuration takes effect.

Example

Configure the 3G modem to select only WCDMA networks to connect to.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] mode wcdma wcdma-only
```

5.11.30 modem auto-recovery track nqa

Function

The **modem auto-recovery track nqa** command configures the device to use an NQA test instance to detect the 3G or LTE link status.

The **undo modem auto-recovery track nqa** command restores the default setting.

By default, the device does not use an NQA test instance to detect a 3G or LTE link.

Format

modem auto-recovery track { **nqa** *admin-name test-name* | **nqa-group** *nqa-group-name* } [**probe-cycle** *period* | **probe-cycle seconds** *period-s*]

undo modem auto-recovery track { **nqa** | **nqa-group** }

NOTE

Only V200R010C10 and later versions support the **nqa-group** *nqa-group-name* parameter.

 Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
admin-name	Specifies the administrator name of an NQA test instance.	The value is a string of 1 to 32 case-sensitive characters without spaces.
test-name	Specifies the name of an NQA test instance.	The value is a string of 1 to 32 case-sensitive characters without spaces.
nqa-group *nqa-group-name*	Indicates the name of an NQA group for an NQA test instance.	The value is a string of 1 to 32 case-sensitive characters without spaces.
probe-cycle *period*	Specifies the interval for querying NQA test results.	The value is an integer that ranges from 1 to 30, in minutes. The default value is 5.
probe-cycle seconds *period-s*	Specifies the interval for querying NQA test results, in seconds.	The value is an integer that ranges from 1 to 1800, in seconds. The default value is 300.

Views

Cellular interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

When a 3G/LTE link becomes unstable because of weak 3G/LTE signals or noises, you may fail to access external networks through the 3G/LTE link even if the dialup succeeds. To prevent this problem, configure the device to use NQA test instances (multiple NQA test instances can be added to an NQA group) to detect the 3G/LTE link status. When the 3G/LTE link is unstable, the device triggers the corresponding action to restore the link.

Prerequisites

ICMP NQA test instances have been configured.

If you need multiple NQA test instances, configure these test instances, add these test instances to an NQA group, and set the test instance type to ICMP.

 Copyright © Huawei Technologies Co., Ltd.

Follow-up Procedure

Run the **modem auto-recovery track action** command to set the maximum number of 3G/LTE link detection failures in an NQA test instance. When the number of consecutive 3G/LTE link detection failures in an NQA test instance reaches the maximum value, the device triggers an action to recover the link.

Example

Configure the device to use an NQA test instance **user user1** to detect a 3G or LTE link.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] modem auto-recovery track nqa user user1
```

Related Topics

5.11.31 modem auto-recovery track action

5.11.31 modem auto-recovery track action

Function

The **modem auto-recovery track action** command sets the maximum number of 3G or LTE link detection failures in an NQA test instance. When the number of consecutive 3G or LTE link detection failures in an NQA test instance reaches the maximum value, the device triggers an action to recover the 3G or LTE link.

The **undo modem auto-recovery** command restores the default setting.

By default, the maximum number of 3G or LTE link detection failures in an NQA test instance is not configured. That is, the device does not trigger an action to recover a 3G or LTE link when 3G or LTE link detection fails for several consecutive times.

Format

modem auto-recovery track action { **plmn-search** | **redial** } **fail-times** *times*

modem auto-recovery track action modem-reboot fail-times *times* [**mandatory**]

undo modem auto-recovery track action { **plmn-search** | **modem-reboot** | **redial** }

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
plmn-search	Configures the device to search the PLMN again when the number of consecutive 3G or LTE link detection failures reaches the maximum value.	-
modem-reboot	Configures the device to restart the 3G or LTE modem when the number of consecutive 3G or LTE link detection failures reaches the maximum value.	-
redial	Configures the device to reconfigure a dial-up connection when the number of consecutive 3G or LTE link detection failures reaches the maximum value.	-
fail-times *times*	Specifies the maximum number of 3G or LTE link detection failures in an NQA test instance.	The value is an integer that ranges from 1 to 128.
mandatory	Configures the device to perform operations based on the NQA detection result without considering the interface status. **NOTE** This parameter is supported in V200R010C10 and later versions.	-

Views

Cellular interface view

Default Level

2: Configuration level

 Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

Usage Scenario

After the **modem auto-recovery track nqa** command is executed to use an NQA test instance to test the 3G or LTE link status, run the **modem auto-recovery track action** command to set the maximum number of 3G or LTE link detection failures in an NQA test instance if the 3G or LTE link is unreachable for a long period. When the number of consecutive 3G or LTE link detection failures in an NQA test instance reaches the maximum value, the device triggers an action (reconfigure a dial-up connection, search the PLMN again or restart the 3G or LTE modem) to recover the 3G or LTE link.

Precautions

When **mandatory** is not specified, the number of link detection failures increases by one if the cellular main interface is Up and there is no incoming traffic on the interface in case of an NQA test failure. When **mandatory** is specified, the number of link detection failures increases by one if NQA tests fail. When the number of link detection failures reaches the threshold, the system restarts the LTE module.

Example

Configure the device to search the PLMN again when the number of consecutive 3G or LTE link detection in an NQA test instance reaches 10.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] modem auto-recovery track action plmn-search fail-times 10
```

Related Topics

5.11.30 modem auto-recovery track nqa

5.11.32 modem auto-recovery dial action modem-reboot fail-times

Function

The **modem auto-recovery dial action modem-reboot fail-times** command sets the maximum number of dial-up failures. When the number of consecutive dial-up failures reaches the maximum value, the device restarts a 3G or LTE modem.

The **undo modem auto-recovery dial action modem-reboot** command deletes the maximum number of dial-up failures.

By default, the maximum number of of dial-up failures is not configured. That is, the device does not restart the 3G modem or restart itself in consecutive dial-up failures

Format

modem auto-recovery dial action modem-reboot fail-times *times*

undo modem auto-recovery dial action modem-reboot

 Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
times	Specifies the maximum number of dial-up failures.	The value is an integer that ranges from 1 to 128. The value less than 8 is recommended.

Views

Cellular interface view

Default Level

2: Configuration level

Usage Guidelines

When the dial-up initiated through a cellular interface fails multiple times, you can run the **modem auto-recovery dial action modem-reboot fail-times** command to set the maximum number of dial-up failures. When the number of consecutive dial-up failures reaches the maximum value, the device restarts the 3G or LTE modem so that the fault can be rectified automatically.

Example

Set the maximum number of dial-up failures to 5.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] modem auto-recovery dial action modem-reboot fail-times 5
```

5.11.33 modem auto-recovery services-unavailable

Function

The **modem auto-recovery services-unavailable** command sets the out-of-service state detection interval and the maximum number of times the 3G/LTE modem automatically restarts.

The **undo modem auto-recovery services-unavailable** command disables the function of automatically restarting the 3G/LTE modem or automatically switching the active and standby SIM cards upon the out-of-service state.

By default, the maximum number of times the 3G/LTE modem automatically restarts and the out-of-service state detection interval are not set on the device. That is, the 3G/LTE modem does not automatically restart or the active and standby SIM cards are not automatically switched upon the out-of-service state.

 Copyright © Huawei Technologies Co., Ltd.

Format

modem auto-recovery services-unavailable action modem-reboot test-times *times* **interval** *interval*

modem auto-recovery services-unavailable action sim-switch [**interval** *interval*]

undo modem auto-recovery services-unavailable

Parameters

Parameter	Description	Value
action modem-reboot	Restarts the 3G/LTE modem automatically upon the out-of-service state.	-
action sim-switch	Switches the active and standby SIM cards automatically upon the out-of-service state.	-
test-times *times*	Specifies the maximum number of times the 3G/LTE modem automatically restarts.	The value is an integer that ranges from 0 to 10. You are not advised to set the value greater than 8. The value 0 indicates that the number of times the 3G/LTE modem automatically restarts is infinite.
interval *interval*	Specifies the out-of-service state detection interval.	The value is an integer that ranges from 60 to 3600, in 5 seconds. The default detection interval is 600 seconds when the active and standby SIM cards are automatically switched upon the out-of-service state.

Views

Cellular interface view

Default Level

2: Configuration level

 Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

When the 3G cellular or LTE cellular interface is in out-of-service state because of a network exception, you can run the **modem auto-recovery services-unavailable action modem-reboot test-times** command to set the out-of-service state detection interval and the maximum number of times the 3G/LTE modem automatically restarts. When the period of time the 3G/LTE modem remains in out-of-service state reaches the detection interval, the 3G/LTE modem automatically restarts or the active and standby SIM cards are switched.

When the interface recovers from the out-of-service state within the detection interval or the number of times the 3G/LTE modem automatically restarts reaches the upper limit, the 3G/LTE modem no longer restarts. You can run the **display cellular** *interface-number* **network** command to view the current status of the 3G/LTE modem. When **Current Service Status** is displayed as **Service available** in the command output, the 3G/LTE modem recovers from the out-of-service state.

Example

Set the out-of-service state detection interval of the 3G/LTE modem to 300s (60*5s) and the maximum number of times the 3G/LTE modem automatically restarts to 5.

```
<Huawei> system-view
[Huawei] interface cellular 1/0/0
[Huawei-Cellular1/0/0] modem auto-recovery services-unavailable action modem-reboot test-times 5 interval 60
```

Set the out-of-service state detection interval of the 3G/LTE modem to 400s. Within the detection interval, the active and standby SIM cards are automatically switched.

```
<Huawei> system-view
[Huawei] interface cellular 1/0/0
[Huawei-Cellular1/0/0] modem auto-recovery services-unavailable action sim-switch interval 400
```

5.11.34 modem encryption-algorithm

Function

The **modem encryption-algorithm** command configures the GPRS encryption algorithm for the 3G/LTE modem.

By default, the 3G/LTE modem supports the GEA1.0 and GEA2.0 encryption algorithms, and does not support the GEA3.0 encryption algorithm.

NOTE

Only routers with built-in ME909s modules support this command.

Format

modem encryption-algorithm { **gea1** | **gea3** }

 Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
gea1	Sets the GPRS encryption algorithm of the 3G/LTE modem to GEA1.0 and GEA2.0.	-
gea3	Sets the GPRS encryption algorithm of the 3G/LTE modem to GEA3.0 and GEA2.0.	-

Views

Cellular interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

When the 3G/LTE modem registers and accesses the network, it uses the GPRS encryption algorithms GEA1.0 and GEA2.0 to initiate a registration with the core network by default. The core network then selects the encryption mode based on the encryption capability of itself. The device can access the network only when the encryption mode matches the device.

If the encryption mode supported by the core network does not match the current device, you can run the **modem encryption-algorithm gea3** command to set the GPRS encryption algorithm of the 3G/LTE modem to GEA2.0 and GEA3.0.

Precautions

This command can be run only when the 3G/LTE modem is in position.

To ensure the configured GPRS encryption algorithm still takes effect when the device accesses the network for the next time, you can restart the modem immediately.

If you choose not to restart the modem immediately, you can run the **modem reboot** command to restart the 3G/LTE modem.

Example

Set the GPRS encryption algorithm of the 3G/LTE modem to GEA1.0 and GEA2.0, and choose not to restart the modem immediately.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] modem encryption-algorithm gea1
```

 Copyright © Huawei Technologies Co., Ltd.

```
Warning: The modified GPRS encryption algorithm can take effect only after the m
odem reboot. The LTE modem will reboot. Continue? [Y/N]:n
Info: The encryption algorithm takes effect next time after the modem reboot.
[Huawei-Cellular0/0/0]
Apr  9 2000 09:16:16+00:00 Huawei 0.0.0.0 %%01IFPDT/4/MODEM_REBOOT(l)[1]:The use
r choose NO when there is a selection about whether to reboot modem.
```

Set the GPRS encryption algorithm of the 3G/LTE modem to GEA3.0 and GEA2.0, and choose to restart the modem immediately.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] modem encryption-algorithm gea3
Warning: The modified GPRS encryption algorithm can take effect only after the m
odem reboot. The LTE modem will reboot. Continue? [Y/N]:y
Apr  9 2000 09:18:01+00:00 Huawei 0.0.0.0 %%01IFPDT/4/MODEM_REBOOT(l)[2]:The use
r choose YES when there is a selection about whether to reboot modem.
```

5.11.35 modem peer network-route

Function

The **modem peer network-route** command enables the function of installing the peer's routes in the local routing table.

The **undo modem peer network-route** command disables the function of installing the peer's routes in the local routing table.

By default, a device is disabled from installing the peer's routes in the local routing table.

NOTE

This function is supported in V200R010C10 and later versions.

Format

modem peer network-route

undo modem peer network-route

Parameters

None

Views

Cellular interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

To enable a device to install the peer's routes in the local routing table, run the **modem peer network-route** command.

 Copyright © Huawei Technologies Co., Ltd.

Precautions

After the **modem peer network-route** command is run, the local routing table contains the peer's routes.

After the **undo modem peer network-route** command is run, the local routing table does not contain the peer's routes.

Example

Enable the function of installing the peer's routes in the local routing table.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] modem peer network-route
```

5.11.36 modem reboot

Function

The **modem reboot** command restarts a 3G/LTE modem.

Format

modem reboot [**fast**]

NOTE

Only the models with built-in ME909s terminal modules in V200R010C10 and later versions support the **fast** parameter.

Parameters

Parameter	Description	Value
fast	Restarts the LTE modem fast.	-

Views

Cellular interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

A 3G/LTE modem restarts automatically when it detects an exception. If the 3G/LTE modem cannot restart automatically, you can run this command to restart it manually.

Copyright © Huawei Technologies Co., Ltd.

Precautions

- When this command is executed to manually restart a 3G/LTE modem, services on the specified cellular interface will be interrupted.
- SIM, USIM, and UIM cards are not hot swappable.

  To ensure that the installed SIM, USIM, and UIM cards work properly, run the **modem reboot** command to manually restart the 3G/LTE modem after hot swapping these cards.

  To check whether SIM, USIM, and UIM cards are working properly, run the **display cellular** command to view the **SIM Status** or **UIM Status** field.

Example

Restart a 3G/LTE modem.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] modem reboot
Warning: The 3G/LTE module will reboot. Continue? [Y/N]:y
```

Related Topics

5.11.17 display cellular

5.11.37 mtu (3G)

Function

Using the **mtu** command, you can set the maximum transmission unit (MTU) for a cellular interface or cellular channel interface.

Using the **undo mtu** command, you can restore the default MTU.

By default, the MTU of a cellular interface or cellular channel interface is 1500 bytes.

Format

mtu *mtu*

undo mtu

Parameters

Parameter	Description	Value
mtu	Specifies the MTU of a cellular interface.	The value is an integer that ranges from 128 to 1500, in bytes.

Views

Cellular interface view, Cellular channel interface view

Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Generally, the IP layer limits the size of a packet sent each time. Any time the IP layer receives an IP packet, it checks to which local interface the packet needs to be sent and obtains the MTU of the interface. Then, the IP layer compares the MTU with the packet size. If the packet size is larger than the MTU, the IP layer disassembles the packet to fragments smaller than the MTU.

If forcible unfragmentation is configured, oversized packets are discarded at the IP layer. To prevent packet loss on the network, large packets must be forcibly fragmented. Run the **mtu** command to set the size of a fragment.

Precautions

If you run the **mtu** command multiple times in the same cellular interface view or cellular channel interface, only the latest configuration takes effect.

Follow-up Procedure

Run the **shutdown** and **undo shutdown**/**restart** commands to restart the related physical interface to make the configuration take effect.

Example

Set the MTU of cellular interface 0/0/0 to 1200 bytes.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] mtu 1200
[Huawei-Cellular0/0/0] restart
```

Related Topics

5.11.18 display interface cellular

5.11.38 multi-apn enable

Function

The **multi-apn enable** command enables the multi-APN function on a cellular interface.

The **undo multi-apn enable** command disables the multi-APN function on a cellular interface.

By default, the multi-APN function is disabled on a cellular interface.

Format

multi-apn enable

undo multi-apn enable

 Copyright © Huawei Technologies Co., Ltd.

Parameters

None

Views

Cellular interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

A cellular interface can be configured with two cellular channel interfaces. After the multi-APN function is configured, you can create two APN profiles and bind the APN profiles respectively to the two cellular channel interfaces. One APN connects to the Internet for data communication, and the other connects to the IMS network for VoIP communication.

Precautions

The multi-APN functions can be configured only on the LTE cellular interface (Cellular 0/0/0) supported by the AR109GW-L, AR121GW-L, AR129CGVW-L, AR161FG-Lc, AR161FG-L, AR169FGW-L, AR169FGVW-L, AR169G-L, AR169EGW-L, AR161G-L, AR161G-Lc, AR161FGW-Lc, and AR161FGW-L.

LTE interface cards (except 1LTE-Lt and 1LTE-Lt-7) support the multi-APN configuration. LTE interface cards support the dual-SIM configuration.

Example

Enable the multi-APN function on the cellular interface.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] multi-apn enable
```

5.11.39 packet-service recover

Function

The **packet-service recover** command configures a 3G or LTE modem to automatically restart and sets the interval at which a 3G or LTE modem automatically restarts.

The **undo packet-service recover** command cancels the configuration.

By default, a 3G or LTE modem does not automatically restart.

Format

packet-service recover *interval*

undo packet-service recover

 Copyright © Huawei Technologies Co., Ltd.

Parameters

Specification	Description	Value
interval	Specifies the interval at which a 3G or LTE modem automatically restarts.	The value is an integer that ranges from 10 to 86400, in seconds.

Views

Cellular interface view

Default Level

2: Configuration level

Usage Guidelines

When a 3G or LTE modem is not attached to a PS domain, you can run the **packet-service recover** command to configure a 3G or LTE modem to automatically restart and set the interval at which the 3G or LTE modem automatically restarts. Then the 3G or LTE modem automatically restarts and starts dialing until it is attached to a PS domain.

Example

Set the interval at which a 3G or LTE modem automatically restarts to 200s.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] packet-service recover 200
```

Related Topics

5.11.17 display cellular

5.11.40 pin modify

Function

The **pin modify** command changes the personal identification number (PIN) of a SIM, USIM or UIM card.

Format

pin modify

Parameters

None

Copyright © Huawei Technologies Co., Ltd.

Views

Cellular interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

You can run this command to set a new PIN for the SIM, USIM or UIM card. The new PIN is saved on the SIM, USIM or UIM card.

Precautions

- This command is valid only when a 3G or LTE modem with a SIM, USIM or UIM card is connected to a cellular interface.
- The PIN of a SIM, USIM or UIM card can be changed only when PIN authentication is enabled on the 3G modem.

Example

Change the PIN.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] pin modify
Enter Current Pin Code:
Enter Pin Code:
Confirm Pin Code:
Warning: PIN will be changed. Continue? [Y/N]:y
PIN has been changed successfully.
```

Related Topics

5.11.41 pin unlock

5.11.42 pin verification

5.11.43 pin verify

5.11.41 pin unlock

Function

The **pin unlock** command unlocks the SIM, USIM or UIM card using the personal identification number unlocked key (PUK) and sets a new PIN.

Format

pin unlock

Parameters

None

 Copyright © Huawei Technologies Co., Ltd.

Views

Cellular interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The PIN unblocking key (PUK) is allocated by the carrier. If a user enters incorrect PINs three consecutive times, the SIM, USIM or UIM card is locked to ensure security of the card. To unlock the card, enter the PUK.

Precautions

This command is valid only when a 3G or LTE modem with a SIM, USIM or UIM card is connected to a cellular interface.

NOTE

If a user enters incorrect PUKs ten consecutive times, the SIM, USIM or UIM card is permanently locked and the user needs to obtain a new one from the carrier.

Example

Unlock the SIM, USIM or UIM card using the PUK and sets a new PIN.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] pin unlock
Enter Current Puk Code:
Enter Pin Code:
Confirm Pin Code:
Warning: PIN will be unlocked and changed. Continue? [Y/N]:y
Unlocking PIN...Please wait...
PIN has been unlocked and changed successfully.
```

Related Topics

5.11.40 pin modify
5.11.42 pin verification
5.11.43 pin verify

5.11.42 pin verification

Function

The **pin verification** command enables or disables PIN authentication on a 3G or LTE modem.

By default, PIN authentication is disabled.

Format

pin verification enable [**auto**]

 Copyright © Huawei Technologies Co., Ltd.

pin verification disable

Parameters

Parameter	Description	Value
enable	Enables PIN authentication.	-
disable	Disables PIN authentication.	-
auto	Indicates automatic PIN authentication. This parameter can be specified if you do not require high security of the SIM, USIM or UIM card. After this parameter is specified, you do not need to enter the PIN every time you use the SIM, USIM or UIM card.	-

Views

Cellular interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

A PIN identifies the user of a SIM, USIM or UIM card.

PIN authentication prevents unauthorized users from using a SIM, USIM or UIM card. You can use a 3G or LTE modem only after the PIN is authenticated.

Precautions

- This command is valid only when a 3G or LTE modem with a SIM, USIM or UIM card is connected to a cellular interface.
- If PIN authentication in auto mode fails, you must manually enter the PIN for authentication.

Example

Enable PIN authentication on the 3G or LTE modem.

 Copyright © Huawei Technologies Co., Ltd.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] pin verification enable auto
Enter Current Pin Code:
```

Related Topics

5.11.40 pin modify

5.11.41 pin unlock

5.11.43 pin verify

5.11.43 pin verify

Function

The **pin verify** command authenticates a PIN.

Format

pin verify [**auto**]

Parameters

Parameter	Description	Value
auto	Indicates automatic PIN authentication. This parameter can be specified if you do not require high security of the SIM, USIM or UIM card. After this parameter is specified, you do not need to enter the PIN every time you use the SIM, USIM or UIM card.	-

Views

Cellular interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Copyright © Huawei Technologies Co., Ltd.

After PIN authentication is enabled, you are required to enter the correct PIN every time you use the SIM, USIM or UIM card. If the PIN authentication fails, data communication is unavailable on the 3G or LTE modem.

Precautions

- If you enter incorrect PINs three consecutive times, the PIN of the SIM, USIM or UIM card is locked.
- This command is valid only when a 3G or LTE modem with a SIM, USIM or UIM card is connected to a cellular interface.

NOTE

A PIN is a decimal integer of 4 to 8 digits. Obtain the initial PIN from the carrier.

Example

Authenticate the PIN.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] pin verify
Enter Current Pin Code:
 Verifying PIN...Please wait...
 PIN has been verified successfully.
```

Related Topics

5.11.40 pin modify

5.11.41 pin unlock

5.11.42 pin verification

5.11.44 plmn search

Function

Using the **plmn search** command, you can configure a 3G or LTE modem to search for available public land mobile networks (PLMNs).

Format

plmn search

Parameters

None

Views

Cellular interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The **plmn search** command is a network detection command.

Precautions

- This command applies only to WCDMA or LTE networks. This command is valid only when a 3G or LTE modem with a SIM or USIM card is connected to a cellular interface.
- It takes several minutes for a 3G or LTE modem to complete the search after this command is executed.

  NOTE

  If the 3G or LTE modem fails to search PLMNs after executing this command, the possible causes include poor signal quality, coverage hole, and signal interference. Wait for a period and run the command again.

Follow-up Procedure

After PLMNs are found, the system shows the searching results. Users can run the **plmn select** command to select a PLMN manually.

Example

Search for PLMNs.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] plmn search
```

Related Topics

5.11.45 plmn select

5.11.45 plmn select

Function

The **plmn select** command allows you to manually select a PLMN for a 3G or an LTE modem or configure the 3G or LTE modem to automatically select a PLMN.

By default, a 3G or an LTE modem automatically selects a PLMN.

Format

Manually selecting a PLMN:

plmn select manual *mcc mnc* [**fail-over-auto**]

undo plmn select manual

Automatically selecting a PLMN:

plmn auto

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
manual	Manually selects a PLMN for a 3G or an LTE modem. When this keyword is used, set the *mcc* and *mnc* parameter.	-
mcc	Specifies the mobile country code (MCC) of a PLMN.	The value is an integer that ranges from 0 to 999.
mnc	Specifies the mobile network code (MNC) of a PLMN.	The value is an integer that ranges from 0 to 999.
fail-over-auto	Indicates that a 3G or an LTE modem automatically selects a PLMN when manual selection of a PLMN fails.	-
auto	Automatically selects a PLMN.	-

Views

Cellular interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

For a WCDMA or an LTE network, you can manually select a PLMN for a 3G or an LTE modem or configure the 3G or LTE modem to automatically select a PLMN.

By default, a 3G or an LTE modem automatically selects a PLMN. If you have subscribed to WCDMA or LTE services and obtained the mobile country code (MCC) and mobile network code (MNC), you can manually select a PLMN.

Precautions

This command applies only to WCDMA or LTE networks. This command is valid only when a 3G or an LTE modem with a SIM or USIM card is connected to a cellular interface.

When the manual PLMN selection mode is use, the automatic PLMN selection mode is restored after you run the **undo plmn select manual** command. When

 Copyright © Huawei Technologies Co., Ltd.

the automatic PLMN selection mode is used, there is no change after you run this command.

NOTE

If the manually selected PLMN is invalid, the 3G or LTE modem cannot connect to the network. Run the **undo plmn select manual** or **plmn auto** command to configure the 3G or LTE modem to automatically select a PLMN, and run the **modem reboot** command to manually restart the modem.

Follow-up Procedure

Run the **display cellular** command to view information about the selected PLMN.

Example

Manually select a PLMN for the 3G or LTE modem.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] plmn select manual 460 03
```

Related Topics

5.11.44 plmn search

5.11.17 display cellular

5.11.46 profile create

Function

Using the **profile create** command, you can create a parameter profile for a 3G or LTE modem and configure an APN in the parameter profile.

Format

profile create *profile-number* { **dynamic** | **static** *apn* }

Parameters

Parameter	Description	Value
profile-number	Specifies the number of a description profile.	The value is 1.
dynamic	Indicates that the 3G modem dynamically sets the access point name (APN).	-
static *apn*	Configures a static APN.	The value is a string of 1 to 99 case-sensitive characters without spaces.

Copyright © Huawei Technologies Co., Ltd.

Views

Cellular interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

An APN identifies a service type on a WCDMA or LTE network. The WCDMA or LTE system provides services for users according to APNs configured for the users.

Precautions

This command applies only to WCDMA or LTE networks. This command is valid only when a 3G or LTE modem with a SIM or USIM card is connected to a cellular interface.

NOTE

APNs vary according to different WCDMA or LTE network carriers. Obtain the APN from the local carrier.

Example

Create a parameter profile for the 3G or LTE modem connected to cellular interface 0/0/0 and configure an APN as 3GNET.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] profile create 1 static 3GNET
```

Related Topics

5.11.47 profile delete

5.11.47 profile delete

Function

Using the **profile delete** command, you can delete the parameter profile of a 3G or LTE modem.

Format

profile delete *profile-number*

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
profile-number	Specifies the number of a description profile.	The value is 1.

Views

Cellular interface view

Default Level

2: Configuration level

Usage Guidelines

This command applies only to WCDMA or LTE networks. This command is valid only when a 3G or LTE modem with a SIM or USIM card is connected to a cellular interface.

Example

Delete the parameter profile of the 3G or LTE modem connected to cellular interface 0/0/0.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] profile delete 1
```

Related Topics

5.11.46 profile create

5.11.48 profile create lte-default

Function

The **profile create lte-default** command configures the default APN for an LTE network.

NOTE

The 1ELTE-L-S card does not support this command.

Format

profile create lte-default *apn* [**user** *username* **password** { **cipher** | **simple** } *password* **authentication-mode** { **chap** | **pap** }]

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
apn	Specifies the default APN for an LTE network.	The value is a string of 1 to 99 case-sensitive characters without spaces. If the string is enclosed in double quotation marks (" "), the string can contain spaces.
user *username*	Specifies the user name provided by the carrier for accessing an external PDN network.	The value is a string of 1 to 127 case-sensitive characters without spaces. If the string is enclosed in double quotation marks (" "), the string can contain spaces.

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
password { **cipher** | **simple** } *password*	Specifies the password provided by the carrier for accessing an external PDN network. There are two types of passwords. • **cipher**: indicates the ciphertext password. You can enter either an explicit or ciphertext password, but the password is displayed in ciphertext in the configuration file. By default, passwords are in ciphertext. • **simple**: indicates the plaintext password. You can enter a plaintext password, and the password is displayed in plaintext in the configuration file. **NOTICE** If you select **simple**, the password is saved in the configuration file in plaintext, posing security risks. You are advised to use the **cipher** option, which means that the passwords are encrypted before being stored.	The value is a string of 1 to 127 case-sensitive characters without spaces. If the string is enclosed in double quotation marks (" "), the string can contain spaces.
authentication-mode { **chap** | **pap** }	Specifies the authentication mode. • **chap**: CHAP authentication • **pap**: PAP authentication	-

Views

Cellular interface view

 Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Some carriers require that devices connect to LTE networks through the default APN, whereas other carriers do not have such requirements. If users are required to connect to a carrier's LTE network through the default APN, you can run the **profile create lte-default** command to configure the default APN for the LTE network.

You can run the **profile delete lte-default** command to delete the default APN configured for an LTE network.

Precautions

This command applies only to LTE networks. This command takes effect only when the LTE modem and SIM/USIM card are installed.

APNs vary depending on LTE network carriers. Obtain the APN from the local carrier.

For the 1LTE-Lt interface cards, the APN configured using the **profile create lte-default** command and the APN configured using the **apn** command overwrite each other. The two commands cannot be configured together.

Example

Set the default APN of an LTE network to CMNET.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] profile create lte-default CMNET
```

Related Topics

5.11.50 profile delete lte-default

5.11.49 profile create lte-default sim-id

Function

The **profile create lte-default sim-id** command configures the default APN for an LTE network.

By default, no default APN is configured for an LTE network.

Format

profile create lte-default *apn* [**user** *username* **password** { **cipher** | **simple** } *password***authentication-mode** { **chap** | **pap** }] **sim-id** *sim-id*

 Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
apn	Specifies the default APN for an LTE network.	The value is a string of 1 to 99 case-sensitive characters without spaces. If the string is enclosed in double quotation marks (" "), the string can contain spaces.
user *username*	Specifies the user name provided by the carrier for accessing an external PDN network.	The value is a string of 1 to 127 case-sensitive characters without spaces. If the string is enclosed in double quotation marks (" "), the string can contain spaces.

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
password { **cipher** | **simple** } *password*	Specifies the password provided by the carrier for accessing an external PDN network. There are two types of password type. • **cipher**: Indicates the cipher text password type. The options are as follows: You can enter either explicit or ciphertext password, but is used to query the configuration file are displayed in ciphertext mode password, The default value is cipher type. • **simple**: Indicates the type of a passwords in plaintext. You can enter passwords in plaintext, the configuration file, the password is displayed in plaintext mode. **NOTICE** If you select simple option, the password is saved in the configuration file in plaintext, causing security risks. You are advised to use the cipher option, the passwords are encrypted before being stored.	The value is a string of 1 to 127 case-sensitive characters without spaces. If the string is enclosed in double quotation marks (" "), the string can contain spaces.
authentication-mode { **chap** | **pap** }	Specifies the authentication mode. • **chap**: CHAP authentication • **pap**: PAP authentication	-
sim-id	Specifies the ID of the SIM card to which the default APN is bound.	The value is 1 or 2, corresponding to the device ID.

Copyright © Huawei Technologies Co., Ltd.

Views

Cellular interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Some carriers require that devices connect to LTE networks through the default APN. In dual-card single-standby scenarios, if the two SIM cards need to connect to different carriers' LTE networks through different default APNs, you can run the **profile create lte-default sim-id** command to bind different default APNs to the IDs of the SIM cards, so that the corresponding default APN is delivered to the LTE module during a SIM card switchover.

You can run the **profile delete lte-default sim-id** command to delete the default APN configured for an LTE network.

Precautions

- This command only applies to LTE networks. This command takes effect only when the LTE modem and SIM/USIM card are installed.
- APNs vary depending on LTE network carriers. Obtain the APN from the local carrier.
- If two SIM cards connect to a carrier's LTE network through the same default APN, it is recommended that you run the **profile create lte-default** command to configure the default APN.
- If the **profile create lte-default** command has been configured, an error message will be displayed when the **profile create lte-default sim-id** command is configured. To run the **profile create lte-default sim-id** command, delete the original configuration first. Similarly, if the **profile create lte-default sim-id** command has been configured, you need to delete the command configuration first before running the **profile create lte-default** command.
- If the **profile create lte-default** command has been used to configure two SIM cards to connect to a carrier's LTE network through the same default APN, you can only delete the default APN configured for the LTE network using the **profile delete lte-default** command.

Example

Set the default APN for SIM card 1 to connect to an LTE network to CMNET.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] profile create lte-default CMNET sim-id 1
```

Related Topics

5.11.51 profile delete lte-default sim-id

 Copyright © Huawei Technologies Co., Ltd.

5.11.50 profile delete lte-default

Function

The **profile delete lte-default** command deletes the default APN configured for an LTE network.

NOTE

The LTE data card E8278 does not support this command.

Format

profile delete lte-default

Parameters

None

Views

Cellular interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Some carriers require that devices connect to LTE networks through the default APN, whereas other carriers do not have such requirements. To delete the default APN configured using the **profile create lte-default** command for an LTE network, run the **profile delete lte-default** command.

Precautions

This command applies only to LTE networks. This command takes effect only when the LTE modem and SIM/USIM card are installed.

Example

Delete the default APN configured for an LTE network.

```
<Huawei> system-view
[Huawei] interface cellular 2/0/0
[Huawei-Cellular2/0/0] profile delete lte-default
```

Related Topics

5.11.48 profile create lte-default

 Copyright © Huawei Technologies Co., Ltd.

5.11.51 profile delete lte-default sim-id

Function

The **profile delete lte-default sim-id** command deletes the default APN configured for an LTE network.

Format

profile delete lte-default sim-id *sim-id*

Parameters

Parameter	Description	Value
sim-id	Specifies the ID of the SIM card to which the default APN to be deleted is bound.	The value is 1 or 2, corresponding to the device ID.

Views

Cellular interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Some carriers require that devices connect to LTE networks through the default APN, whereas other carriers do not have such requirements. To delete the default APN configured for an LTE network using the **profile create lte-default sim-id** command, run the **profile delete lte-default sim-id** command.

Precautions

- This command only applies to LTE networks. This command takes effect only when the LTE modem and SIM/USIM card are installed.
- If the default APN for the SIM card to connect to a carrier's LTE network has been configured using the **profile create lte-default sim-id** command, you can only delete the default APN configured for the LTE network using the **profile delete lte-default_sim-id** command.

Example

Delete the default APN for SIM card 1 to connect to an LTE network.

```
<Huawei> system-view
[Huawei] interface cellular 2/0/0
[Huawei-Cellular2/0/0] profile delete lte-default sim-id 1
```


Copyright © Huawei Technologies Co., Ltd.

Related Topics

5.11.49 profile create lte-default sim-id

5.11.52 reset counters cellular

Function

Using the **reset counters cellular** command, you can clear traffic statistics on a cellular interface or cellular channel interface.

Format

reset counters interface cellular [*interface-number*]

Parameters

Parameter	Description	Value
interface-number	Specifies the number of a cellular interface or cellular channel interface.	-

Views

User view

Default Level

3: Management level

Usage Guidelines

Before collecting traffic statistics on a cellular interface or cellular channel interface, run the **reset counters cellular** command to clear the existing traffic statistics.

Example

Clear traffic statistics on cellular interface 0/0/0.

```
<Huawei> reset counters interface cellular 0/0/0
```

Related Topics

5.11.18 display interface cellular

Copyright © Huawei Technologies Co., Ltd.

5.11.53 rssi-threshold

Function

The **rssi-threshold** command sets the RSSI threshold for successfully establishing a 3G/LTE link. Only when the RSSI is greater than the threshold, a 3G/LTE modem can establish a 3G/LTE link successfully.

The **undo rssi-threshold** restores the default setting.

By default, a 3G/LTE modem does not establish a 3G/LTElink based on the RSSI threshold.

Format

rssi-threshold *rssi-threshold*

undo rssi-threshold

Parameters

Parameter	Description	Setting
rssi-threshold	Specifies the RSSI threshold for successfully establishing a 3G/LTE link.	The value is an integer that ranges from -120 to -60, in dBm.

Views

Cellular interface view, Cellular channel interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Usually, signal quality does not affect 3G/LTE link establishment by a 3G/LTE modem in dialup mode. You can use the **rssi-threshold** command to configure signal quality to affect establishment and disconnection of 3G/LTE links. When the RSSI is less than or equal to the threshold, the 3G/LTE modem cannot establish 3G/LTE link in dialup mode, and the established 3G/LTE links will be disconnected.

- When services have high 3G/LTE link quality requirements and will be greatly affected by poor link quality, set a large RSSI threshold to detect link quality and take measures in a timely manner.
- When services have low 3G/LTE link quality requirements and will be slightly affected by poor link quality, set a small RSSI threshold to prevent establishment failures and disconnection of 3G/LTE links.

Copyright © Huawei Technologies Co., Ltd.

Precautions

- When you run the **rssi-threshold** *rssi-threshold* command multiple times on a cellular interface or cellular channel interface, only the latest configuration takes effect.
- When you run the **rssi-threshold** command on both the cellular interface and cellular channel interface, only the configuration on the cellular channel interface takes effect.

Example

Set the RSSI threshold for successfully establishing a 3G/LTE link to -100 dBm.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] rssi-threshold 100
```

5.11.54 service domain

Function

The **service domain** command configures the service domain of a 3G or an LTE modem.

By default, a 3G or an LTE modem works in both the CS domain and PS domain.

Format

service domain { **ps-only** | **combined** }

Parameters

Parameter	Description	Value
ps-only	Configures a 3G or an LTE modem to work only in the PS domain.	-
combined	Configures a 3G or an LTE modem to work in both the CS domain and PS domain.	-

Views

Cellular interface view

Default Level

2: Configuration level

Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

Usage Scenario

The 3G network supports both the CS domain and PS domain. The LTE network supports only the PS domain. To prevent services in the CS domain from changing the network from an LTE network to a 3G network, you can run the **service domain ps-only** command to configure an LTE modem to work only in the PS domain when it connects to an LTE network.

Precautions

You can run the **display cellular** command to view the configured service domain of a 3G or an LTE modem.

After configuring the service domain of a 3G or an LTE modem, run the **modem reboot** command to restart the 3G or an LTE modem to make the configuration take effect.

Example

Configure an LTE modem to work only in the PS domain.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] service domain ps-only
Info: The service domain will take effect after modem reboot.
```

Related Topics

5.11.17 display cellular

5.11.55 sim-card reboot

Function

The **sim-card reboot** command restarts a SIM, USIM, or UIM card.

NOTE

Only the models with built-in ME909s terminal modules in V200R010C10 and later versions support this command.

Format

sim-card reboot

Parameters

None

Views

Cellular interface view

 Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

A 3G/LTE modem can automatically detect whether a SIM, USIM, or UIM card is properly installed. To restart a SIM, USIM, or UIM card, run the **sim-card reboot** command.

Precautions

- When this command is executed to manually restart a SIM, USIM, or UIM card, services on the specified cellular interface will be interrupted.
- SIM, USIM, and UIM cards are not hot swappable.

  To ensure that the installed SIM, USIM, and UIM cards work properly, run the **sim-card reboot** command to manually restart the cards after hot swapping these cards.

  To check whether SIM, USIM, and UIM cards are working properly, run the **display cellular** command to view the **SIM Status** or **UIM Status** field.

Example

Restart a SIM, USIM, or UIM card.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] sim-card reboot
Warning: The 3G/LTE SIM/USIM card will reset. Continue? [Y/N]:y
```

Related Topics

5.11.17 display cellular

5.11.56 sim-id

Function

The **sim-id** command sets the ID of a SIM card on an APN profile to determine the master or backup SIM card to be bound to the APN profile.

The **undo sim-id** command restores the default setting.

The default ID of a SIM card is 1.

Format

sim-id *sim-id*

undo sim-id

 Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
sim-id	Specifies the ID of the SIM card bound to an APN profile.	The value is 1 or 2. • The value 1 indicates that the APN profile is bound to the master SIM card. • The value 2 indicates that the APN profile is bound to the backup SIM card.

Views

APN profile view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

To improve data transmission reliability of the 3G or LTE link, you can use two 3G cellular interfaces One cellular interface functions as the master link to connect to a 3G or LTE network, the other cellular interface functions as the backup link to connect to another 3G or LTE network. When the master 3G or LTE link is faulty, traffic is automatically switched to the backup 3G or LTE link, improving reliability of access to the Internet.

However, some devices do not support two cellular interfaces or the costs of two cellular interfaces are high for users. Users can use a cellular interface supporting dual SIM cards. One SIM card functions as the master SIM card, the other SIM card functions as the backup SIM card. The master and backup SIM cards connect to different 3G or LTE networks. If dial-up fails because the account balance of the master SIM card is insufficient, the master SIM card is faulty, the 3G or LTE link signal quality is poor, or the connected 3G or LTE network is faulty, traffic is automatically switched to the backup SIM card, ensuring uninterrupted enterprise services.

You can run the **sim-id** command on an APN profile to set the ID of a SIM card to determine the master or backup SIM card to be bound to the APN profile.

- When the APN profile is bound to the master SIM card, the cellular interface can connect to the 3G or LTE network through the master SIM card.
- When the APN profile is bound to the backup SIM card, the cellular interface can connect to the 3G or LTE network through the backup SIM card.
- When the cellular interface are bound both to the APN profiles, the master SIM card is preferentially used to connect to the 3G or LTE network. Only if

 Copyright © Huawei Technologies Co., Ltd.

dial-up fails because the account balance of the master SIM card is insufficient, the master SIM card is faulty, the 3G or LTE link signal quality is poor, or the connected 3G or LTE network is faulty, traffic is automatically switched to the backup SIM card.

Precautions

If you run the **sim-id** command in the same APN profile view multiple times, only the latest configuration takes effect.

The master and backup SIM cards cannot simultaneously work. Upon a SIM card switchover, traffic is interrupted for a short period.

Example

Set the ID of the SIM card bound to the APN profile **ltenet** to 2, indicating that **ltenet** is bound to the backup SIM card.

```
<Huawei> system-view
[Huawei] apn profile ltenet
[Huawei-apn-profile-ltenet] sim-id 2
```

Related Topics

5.11.2 apn profile

5.11.3 apn-profile

5.11.57 sim switch to

5.11.58 sim switch rssi-threshold

5.11.57 sim switch to

Function

The **sim switch to** command enables manual switchover between SIM cards.

Format

sim switch to *sim-id*

Parameters

Parameter	Description	Value
sim-id	Specifies the ID of the SIM card to which 3G services are switched.	The value is 1 or 2. • The value 1 indicates that 3G services are manually switched to the master SIM card. • The value 2 indicates that 3G services are manually switched to the backup SIM card.

Copyright © Huawei Technologies Co., Ltd.

Views

Cellular interface view, Cellular channel interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

When automatic SIM card switchover is not configured or the switchover condition is not met, you can run the **sim switch to** command to manually switch between SIM cards.

Precautions

Manual switchover between SIM cards leads to service interruption for a short period and affects service transmission. Exercise caution when performing this operation.

Example

Manually switch 3G or LTE services to the backup SIM card.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] sim switch to 2
```

Related Topics

5.11.3 apn-profile

5.11.56 sim-id

5.11.58 sim switch rssi-threshold

5.11.58 sim switch rssi-threshold

Function

The **sim switch rssi-threshold** command enables automatic switchover between SIM cards based on the received signal strength indicator (RSSI) threshold.

The **undo sim switch rssi-threshold** command disables automatic switchover between SIM cards based on the RSSI threshold.

By default, a cellular interface does not switch between SIM cards based on the RSSI threshold.

Format

sim switch rssi-threshold *rssi-threshold*

undo sim switch rssi-threshold

 Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
rssi-threshold	Specifies the RSSI threshold for switching between SIM cards. When the received signal strength is lower than the RSSI threshold, the cellular interface automatically switches between SIM cards. For example, if the RSSI threshold is -105 dBm, the SIM cards are switched when the received signal strength is lower than -105 dBm.	The value is an integer that ranges from -120 to -60, in dBm. The recommended RSSI threshold is -105 dBm.

Views

Cellular interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

When two SIM cards are available, if the 3G or LTE link signal quality on one SIM card is poor and affects data transmission, the other SIM card needs to provide 3G or LTE services in time.

The RSSI indicates the strength of signals received on a cellular interface. You can run the **sim switch rssi-threshold** command to configure automatic switchover between SIM cards based on the RSSI threshold. When the received signal strength is lower than the RSSI threshold, the cellular interface automatically switches between SIM cards.

Precautions

Set a proper RSSI threshold based on the 3G or LTE link signal quality.

- A large RSSI threshold (such as -70 dBm) results in frequent switchovers between SIM cards. Traffic is frequently interrupted.
- A small RSSI threshold (such as -110 dBm) results in no switchover between SIM cards even if the 3G or LTE link signal quality is poor. The SIM card providing poor-quality 3G or LTE services is always in use.

If you run the **sim switch rssi-threshold** *rssi-threshold* command in the same cellular interface view multiple times, only the latest configuration takes effect.

 Copyright © Huawei Technologies Co., Ltd.

Example

Configure automatic switchover between SIM cards when the signal strength is lower than -105 dBm.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] sim switch rssi-threshold 105
```

Related Topics

5.11.56 sim-id

5.11.57 sim switch to

5.11.59 sim switch-back enable

Function

The **sim switch-back enable** command enables automatic switchback to the master SIM card.

The **undo sim switch-back enable** command disables automatic switchback to the master SIM card.

By default, traffic on the backup SIM card is not automatically switched back to the master SIM card.

Format

sim switch-back enable [**timer** *time*]

undo sim switch-back enable

Parameters

Parameter	Description	Value
timer *time*	Indicates the specified period of time after which traffic on the backup SIM card is automatically switched back to the master SIM card. When this parameter is not specified, traffic on the backup SIM card is switched back to the master SIM card after 60 minutes.	The value is an integer that ranges from 1 to 65535, in minutes.

Copyright © Huawei Technologies Co., Ltd.

Views

Cellular interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

When 3G or LTE link signal quality is poor on the master SIM card or the connected carrier network is faulty, traffic is automatically switched to the backup SIM card. After a period of time, 3G or LTE link signal quality on the master SIM card becomes good or the connected carrier network is recovered. You can run the **sim switch-back enable** command to automatically switch traffic back to the master SIM card.

Precautions

If you run the **sim switch-back enable timer** *time* command in the same cellular interface view multiple times, only the latest configuration takes effect.

After the **sim switch-back enable** [**timer** *time*] command is executed to enable switchback from the backup SIM card to the master SIM card, you need to verify that the 3G or LTE link on the master SIM card is normal after the period specified by **timer** *time*. Otherwise, traffic is frequently switched between the master and backup SIM cards, affecting service transmission.

Example

Enable automatic traffic switchback from the backup SIM card to the master SIM card.

```
<Huawei> system-view
[Huawei] interface cellular 0/0/0
[Huawei-Cellular0/0/0] sim switch-back enable
```

Related Topics

5.11.56 sim-id

5.11.57 sim switch to

5.11.58 sim switch rssi-threshold

5.11.60 sms delete interface cellular

Function

The **sms delete interface cellular** command deletes SMS messages saved in the SIM card.

Format

sms delete interface cellular *interface-number* { *sms-id* | **all** }

 Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
interface-number	Specifies the number of a cellular interface or cellular channel interface.	-
sms-id	Specifies the ID of an SMS message to be deleted.	The value is an integer that ranges from 0 to 255.
all	Deletes all SMS messages.	-

Views

System view

Default Level

2: Configuration level

Usage Guidelines

The device can receive SMS messages sent by user mobile phones and save the SMS messages in the SIM card. If the number of SMS messages saved in the SIM card exceeds the maximum number, you can run this command to delete the SMS messages.

Example

Delete all SMS messages saved in the SIM card.

```
<Huawei> system-view
[Huawei] sms delete interface cellular 2/0/0 all
Info: SMS delete success.
```

5.11.61 sms send interface cellular

Function

The **sms send interface cellular** command sends an SMS message to a specified destination number.

Format

sms send interface cellular *interface-number destination-telephone-number*

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
interface-number	Specifies the number of a cellular interface or cellular channel interface.	-
destination-telephone-number	Specifies the destination number that receives the SMS message.	The value is a string of 1 to 21 characters without spaces. It can contain an asterisk (*), a plus sign (+), a number sign (#), and digits 0 to 9. The plus sign (+) can be used only at the start of a character string. If a character string starts with a plus sign (+), the maximum string length is 21. If a character string starts with other characters, the maximum string length is 20.

Views

System view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

To send an SMS message to a specified mobile number, you can run this command and write the SMS message to send it to the destination number.

Precautions

This command is an interactive command. After running the command, you can press **Enter** and enter the SMS message as prompted. Currently, the device can only send English SMS messages.

The content of an SMS message is a string of 0 to 160 case-sensitive characters with spaces. An SMS message uses a percent sign (%) as the terminator. The percent sign (%) is not included in the SMS message content.

A line feed in the SMS message content is considered as two characters, and cannot be deleted after being entered.

 Copyright © Huawei Technologies Co., Ltd.

The 1LTE-Lt and 1LTE-Lt-7 cards do not support the function of sending SMS messages using China Telecom SIM cards.

Example

Configure the device to send the SMS message "I have received your message." to the user with the mobile number 13812345678.

```
<Huawei> system-view
[Huawei] sms send interface cellular 2/0/0 +8613812345678
Info: Please input sms content within 160 characters, end with character '%':
I have received your message.%
Info: SMS send success.
```

5.11.62 sms-pool

Function

The **sms-pool** command displays the SMS service pool view.

The **undo sms-pool** command deletes all configurations in the SMS service pool view.

By default, there is no configuration in the SMS service pool view.

Format

sms-pool

undo sms-pool

Parameters

None

Views

System view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Before running the **sms item** command to configure an SMS service, run the **sms-pool** command to enter the SMS service pool view.

Precautions

If an SMS service in the SMS service pool has been referenced by the **sms send-item** command, short messages cannot be sent after the **undo sms-pool** command is run to delete the configuration from the SMS service pool.

 Copyright © Huawei Technologies Co., Ltd.

Example

Display the SMS service pool view.

```
<Huawei> system-view
[Huawei] sms-pool
[Huawei-sms-pool]
```

Related Topics

5.11.63 sms item

5.11.64 sms send-item

5.11.63 sms item

Function

The **sms item** command configures the phone numbers for receiving short messages, and short message content in the SMS service pool.

The **undo sms item** command deletes the configured SMS services.

By default, no SMS service is configured in the SMS service pool.

Format

sms item *item-id* **telephone-number** *tel-number* &<1-3> **content**

undo sms item *item-id*

Parameters

Parameter	Description	Value
item-id	Specifies the ID of an SMS service.	The value is an integer that ranges from 1 to 20.
telephone-number *tel-number*	User phone number for receiving short messages. A maximum of three phone numbers can be specified. **NOTE** A user's phone number must be valid; otherwise, the user cannot receive short messages.	The value is a string of 1 to 21 characters. The value can contain the digits 0-9 and plus sign (+), and does not support spaces. In addition, the plus sign (+) can only be the first character in the value. When the first character is the plus sign (+), the maximum value length is 21. When the first character is a digit, the maximum value length is 20.

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
content	Specifies the short message content. **NOTE** This command is an interactive command. After running the command, press **Enter** and enter the short message content as prompted.	The value is a string of 1 to 160 case-sensitive characters with spaces. The value ends with %.

Views

SMS service pool view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

After the SMS service is configured in the SMS service pool, run the **sms send-item** command on a service interface to reference the SMS service with a specified ID. When the service interface status changes, the short message preset in the SMS service is sent to the specified user phone number.

Precautions

A maximum of 20 SMS services can be configured in an SMS service pool. Each SMS service can be preset with 3 phone numbers. Each short message can contain at most 160 characters. The short message content is configured to end with %.

When the SMS service with a specified ID is referenced, it can be modified and can be deleted. If the SMS service is deleted, short messages cannot be sent.

Example

Configure the SMS service with ID 1 to send the short message "The interface is in Up state." to the phone number +8613812345678.

```
<Huawei> system-view
[Huawei] sms-pool
[Huawei-sms-pool] sms item 1 telephone-number +8613812345678 content
Info: Please input the sms content within 160 characters, end with '%':
The interface is in Up state.%
```

Related Topics

5.11.62 sms-pool

5.11.64 sms send-item

Copyright © Huawei Technologies Co., Ltd.

5.11.64 sms send-item

Function

The **sms send-item** command configures the SMS alarm function on an interface to send a specified short message alarm to specific users when the interface status changes.

The **undo sms send-item** command deletes the configured SMS alarm function.

By default, the SMS alarm function is not configured on an interface.

Format

sms send-item *item-id* **track-interface** { **up** | **down** } [**after** *time*]

undo sms send-item *item-id*

Parameters

Parameter	Description	Value
item-id	Specifies the ID of the SMS service to be referenced. **NOTE** The value of *item-id* must have been configured using the **sms item** command; otherwise, the command cannot be run.	The value is an integer that ranges from 1 to 20.
track-interface { **up** | **down** }	Sends a short message alarm when detecting that the link status changes.	-
after *time*	Specifies the delay for sending a short message alarm. If **after** *time* is not specified, a short message alarm is sent immediately. After this parameter is specified, a short message alarm is sent only when the link status remains unchanged within the value of *time*. If the link status changes within the time, no short message alarm is sent.	The value is an integer that ranges from 1 to 65535, in minutes.

Copyright © Huawei Technologies Co., Ltd.

Views

Cellular interface view, ATM interface view, serial interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

In the scenario of active/standby interface backup, when the active and standby links are switched, the active/standby interface status changes. Users can view the alarm on the device to know the interface status change. If users want to sense the interface status change anytime and anywhere, run this command to configure the SMS alarm function on the interface. After the function is configured, the alarm with the interface status change is sent to users in a short message.

Prerequisites

The SMS service with a specified ID has been configured using the **sms item** command.

Precautions

Currently, the SMS alarm function can be configured on interfaces only when cellular, ATM, and serial interfaces are used as the active and standby interfaces.

This command can be run on each interface at most four times, and the latest configuration does not override the previous ones.

Example

Configure the SMS alarm function on Cellular2/0/0 to send the short message "The interface is in Up state." to the phone number +8613812345678 when the link on the interface goes Up. Send the short message "The interface is still in Up state." to the phone number if services are not switched back to the active link after 120 minutes.

```
<Huawei> system-view
[Huawei] sms-pool
[Huawei-sms-pool] sms item 1 telephone-number +8613812345678 content
Info: Please input the sms content within 160 characters, end with '%':
The interface is in Up state.%
[Huawei-sms-pool] sms item 2 telephone-number +8613812345678 content
Info: Please input the sms content within 160 characters, end with '%':
The interface is still in Up state.%
[Huawei-sms-pool] quit
[Huawei] interface cellular 2/0/0
[Huawei-Cellular2/0/0] sms send-item 1 track-interface up
[Huawei-Cellular2/0/0] sms send-item 2 track-interface up after 120
```

Related Topics

5.11.63 sms item

 Copyright © Huawei Technologies Co., Ltd.

5.11.65 sms service-center-address

Function

The **sms service-center-address** command configures the SMS center number on a cellular interface.

The **undo sms service-center-address** command deletes the configured SMS center number.

By default, no SMS center number is configured on a cellular interface.

Format

sms service-center-address *service-center-number*

undo sms service-center-address

Parameters

Parameter	Description	Value
service-center-number	Specifies the SMS center number.	The value is a string of 1 to 21 characters. The value can contain the digits 0-9 and plus sign (+). It does not support spaces. In addition, the plus sign (+) can only be the first character in the value. When the first character is the plus sign (+), the maximum value length is 21. When the first character is a digit, the maximum value length is 20.

Views

Cellular interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Copyright © Huawei Technologies Co., Ltd.

You can run this command on a cellular interface to configure the SMS center number used for the interface to send short messages.

Precautions

Only one SMS center number can be configured on each cellular interface.

Example

Configure the SMS center number +8613800000000 on Cellular2/0/0.

```
<Huawei> system-view
[Huawei] interface cellular 2/0/0
[Huawei-Cellular2/0/0] sms service-center-address +8613800000000
```

5.11.66 snmp-agent trap enable feature-name ifmtrap

Function

The **snmp-agent trap enable feature-name ifmtrap** command enables the trap function for the IFM module.

The **undo snmp-agent trap enable feature-name ifmtrap** command disables the trap function for the IFM module.

By default, the **hw3GPinModify** trap function is enabled and other trap functions for the IFM module are disabled.

Format

snmp-agent trap enable feature-name ifmtrap [**trap-name** { **hw3gmibtrapcellidchange** | **hw3gpinmodify** | **hwportphysicalethfullduplexclear** | **hwportphysicalethhalfduplexalarm** | **hwportspeedchangetrap** }]

undo snmp-agent trap enable feature-name ifmtrap [**trap-name** { **hw3gmibtrapcellidchange** | **hw3gpinmodify** | **hwportphysicalethfullduplexclear** | **hwportphysicalethhalfduplexalarm** | **hwportspeedchangetrap** }]

Parameters

Parameter	Description	Value
trap-name	Enables the trap function for a specified event. If this parameter is not specified, all trap functions for the IFM module are enabled.	-
hw3gmibtrapcellidchange	Enables the trap function for the cell ID change.	-

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
hw3gpinmodify	Enables the trap function for the PIN change.	-
hwportphysicalethfullduplexclear	Enables the trap function for the interface duplex mode change from half-duplex to full-duplex.	-
hwportphysicalethhalfduplexalarm	Enables the trap function for the interface duplex mode change from full-duplex to half-duplex.	-
hwportspeedchangetrap	Enables the trap function for the interface rate change.	-

Views

System view

Default Level

3: Management level

Usage Guidelines

You can specify **trap-name** to enable the trap function for a specified event.

Example

Enable the trap function for the interface duplex mode change from full-duplex to half-duplex.

```
<Huawei> system-view
[Huawei] snmp-agent trap enable feature-name ifmtrap trap-name
hwportphysicalethhalfduplexalarm
```

Related Topics

5.11.23 display snmp-agent trap feature-name ifmtrap all

5.11.67 user

Function

The **user** command configures the user name, password, and authentication mode for accessing an external PDN network.

The **undo user** command deletes the user configured for accessing an external PDN network.

By default, the user name, password, and authentication mode for accessing an external PDN network are not configured.

Copyright © Huawei Technologies Co., Ltd.

Format

user name *username* **password** { **cipher** | **simple** } *password* [**authentication-mode** { **auto** | **pap** | **chap** }]

undo user name *username*

Parameters

Parameter	Description	Value
name *username*	Specifies the user name for accessing an external PDN network, which is provided by the carrier.	The value is a string of 1 to 64 case-sensitive characters without spaces.
cipher	Displays the password in cipher text.	-
simple	Displays the password in plain text. **NOTE** When you specify **simple**, the password is saved in plain text in the configuration, which brings potential security risks. You are advised to specify **cipher** to save the password in the cipher text.	-
password	Specifies the user password for accessing an external PDN network, which is provided by the carrier.	The value is a case-sensitive character string without spaces. If **simple** is specified, the password is in plain text and contains 1 to 32 characters. If **cipher** is specified, the password is either in cipher text containing 24 to 68 characters, for example, %^ %#k5bf>8df@:_;Na'+R"U ,#L#w88HE1M.L4YY2~W 2u0%RDL#z#%^%#, or in plain text containing 1 to 32 characters, for example, 214357.

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
authentication-mode { **auto** | **pap** | **chap** }	Specifies the authentication mode. • **auto**: PAP or CHAP authentication • **pap**: PAP authentication • **chap**: CHAP authentication When the **authentication-mode** parameter is not specified, the **auto** mode is used by default. **NOTE** Select a proper authentication mode based on the carrier network. PAP authentication provides lower security. When you specify **auto** or **pap** to enable the device to use PAP authentication, the password is transmitted in plain text on the network. This brings potential security risks.	-

Views

APN profile view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

A user uses a cellular interface to access an external PDN network through a 3G or LTE network. To ensure information security, the external PDN network authenticates the access user. The user can use the cellular interface to perform data communication with the external PDN network through a 3G or LTE network only after the user passes the authentication.

Precautions

Contact the carrier when configuring the user name, password, and authentication mode.

 Copyright © Huawei Technologies Co., Ltd.

Example

Configure the user name, password, and authentication mode for accessing the external PDN network.

```
<Huawei> system-view
[Huawei] apn profile 3gnet
[Huawei-apn-profile-3gnet] user name jack password cipher huawei@123 authentication-mode chap
```

Related Topics

5.11.2 apn profile

5.12 ISDN BRI Interface Configuration Commands

5.12.1 loopback (ISDN BRI interface view)

Function

Using the **loopback** command, you can configure loopback detection on an ISDN BRI interface.

Using the **undo loopback** command, you can disable loopback detection on an ISDN BRI interface.

By default, loopback detection is disabled on an ISDN BRI interface.

Format

loopback { **local** | **remote** } [**b1** | **b2** | **both**]

undo loopback

Parameters

Parameter	Description	Value
local	Configures local loopback on an ISDN BRI interface.	-
remote	Configures remote loopback on an ISDN BRI interface.	-
b1	Configures loopback detection on the B1 channel.	-
b2	Configures loopback detection on the B2 channel.	-

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
both	Configures loopback detection on both the B1 channel and B2 channel.	-

Views

ISDN BRI interface view

Default Level

2: Configuration level

Usage Guidelines

The loopback detection function monitors the interface status or cable status and must be disabled when devices are working properly.

- In local loopback mode, the local device loops back outgoing packets to itself to test whether it is working properly.
- In remote loopback mode, the local device loops back the packets received from its peer device to the peer device to test whether the link between the two devices is working properly.

Example

Configure loopback detection on an ISDN BRI interface.

```
<Huawei> system-view
[Huawei] interface bri 1/0/0
[Huawei-Bri1/0/0] loopback remote b1
```

Related Topics

5.12.2 display interface bri

5.12.2 display interface bri

Function

Using the **display interface bri** command, you can view information about an ISDN BRI interface, including the running status and statistics.

Format

display interface bri [*interface-number*]

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
interface-number	Specifies the number of an ISDN BRI interface.	If no interface number is specified, information about all ISDN BRI interfaces including B channels and D channels is displayed. **NOTE** • The interface number of a signaling channel (D channel) is in the format of *interface-number*. • In a data channel (B channel), the interface number of the B1 channel is in the format of *interface-number*.1 and that of the B2 channel is in the format of *interface-number*.2.

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

When monitoring the ISDN BRI interface status or locating faults on an ISDN BRI interface, run the **display interface bri** command to obtain the interface information, including the running status and traffic statistics. You can collect traffic statistics and locate faults on the interface according to the command output.

Example

Display information about BRI 1/0/0.

```
<Huawei> display interface bri 1/0/0
Bri1/0/0 current state : UP
Line protocol current state : UP (spoofing)
Description:HUAWEI, AR Series, Bri1/0/0 Interface
Route Port,The Maximum Transmit Unit is 1500, Hold timer is 10(sec)
baudrate is 192000 bps,  Timeslot(s) Used: 1, 2
Internet Address is 2.2.2.1/24
Encapsulation is ISDN
Current system time: 2011-06-28 17:12:30
Last 300 seconds input rate 0 bytes/sec 0 bits/sec 0 packets/sec
```

 Copyright © Huawei Technologies Co., Ltd.

```
Last 300 seconds output rate 0 bytes/sec 0 bits/sec 0 packets/sec

Input: 0 packets, 0 bytes
  No Buffers:             0
Output: 0 packets, 0 bytes
  No Buffers:             0,  Underruns:             0

    Input bandwidth utilization  : 0.00%
    Output bandwidth utilization : 0.00%
```

Display information about BRI 1/0/0:1.

```
<Huawei> display interface bri 1/0/0:1
Bri1/0/0:1 current state : UP
Line protocol current state : UP
Description:HUAWEI, AR Series, Bri1/0/0:1 Interface
Route Port,The Maximum Transmit Unit is 1500
baudrate is 64000 bps,  Timeslot(s) Used: 1
Link layer protocol is PPP
LCP initial
Last physical up time   : 2011-06-22 13:07:41
Last physical down time : 2011-06-22 13:06:11
Current system time: 2011-06-28 17:15:12
Last 300 seconds input rate 0 bytes/sec 0 bits/sec 0 packets/sec
Last 300 seconds output rate 0 bytes/sec 0 bits/sec 0 packets/sec

Input: 0 packets, 0 bytes
  No Buffers:             0
Output: 0 packets, 0 bytes
  No Buffers:             0,  Underruns:             0

    Input bandwidth utilization  : 0.00%
    Output bandwidth utilization : 0.00%
```

Table 5-43 Description of the display interface bri command output

Item	Description
Bri1/0/0 current state	Current physical status of the ISDN BRI interface: • UP: indicates that the interface is physically Up. • DOWN: indicates that the interface is physically Down. • Administratively down: indicates that the administrator has run the **shutdown** command on the interface.
Line protocol current state	Link layer protocol status of the interface: • UP: indicates that the link layer-protocol status of the interface is Up. • DOWN: indicates that the link layer protocol status of the interface is Down or no IP address is assigned to the interface.
Description	Interface description.
baudrate	Interface baud rate.
Timeslot(s) Used	Timeslots used in a data channel.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Internet Address is	IP address and mask length configured on the interface. According to different assignment modes of IP addresses, this parameter is displayed in the following ways: • If IP address is configured manually, the parameter is displayed as **Internet Address is 1.1.1.1/24.** • If IP address is assigned by DHCP, the parameter is displayed as **Internet Address is allocated by DHCP, 1.1.1.1/24.** If no IP address is configured on the interface, the parameter is displayed as **Internet protocol processing : disabled.**
Encapsulation is ISDN	The packet encapsulation format is ISDN.
Link layer protocol	Link layer protocol of the ISDN BRI interface.
LCP initial	A PPP connection is established successfully.
Last physical up time	Last time the link layer protocol of the interface goes Up.
Last physical down time	Last time the link layer protocol of the interface goes Down.
Current system time	Current system time. If the time zone is configured and the daylight saving time is used, the time is in YYYY/MM/DD HH: MM: SS UTC±HH: MM DST format.
No Buffers	Number of received packets that cannot be buffered.
Underruns	Number of sent packets below the lower limit of the FIFO queue.
Input	Total number of received packets.
Output	Total number of sent packets.
Input bandwidth utilization	Inbound bandwidth usage.
Output bandwidth utilization	Outbound bandwidth usage.

5.12.3 interface bri

Function

Using the **interface bri** command, you can enter the signaling channel (D channel) of an ISDN BRI interface.

Copyright © Huawei Technologies Co., Ltd.

Format

interface bri *interface-number*

Parameters

Parameter	Description	Value
interface-number	Specifies the number of an ISDN BRI interface.	-

Views

System view

Default Level

2: Configuration level

Usage Guidelines

Before setting attributes for an ISDN BRI interface, run the **interface bri** command to enter the signaling channel (D channel) of an ISDN BRI interface.

Example

Enter the signaling channel (D channel) of an ISDN BRI interface.

```
<Huawei> system-view
[Huawei] interface bri 1/0/0
[Huawei-Bri1/0/0]
```

Related Topics

5.12.2 display interface bri

5.12.4 mtu (ISDN BRI interface view)

Function

Using the **mtu** command, you can set the maximum transmission unit (MTU) for an ISDN BRI interface.

Using the **undo mtu** command, you can restore the default MTU.

By default, the MTU of an ISDN BRI interface is 1500 bytes.

Format

mtu *mtu*

undo mtu

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
mtu	Specifies the MTU of an ISDN BRI interface.	The value is an integer, in bytes. The value depends on the device.

Views

ISDN BRI interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The size of data frames is limited at the network layer. Whenever receiving an IP packet, the IP layer determines the next-hop interface for the packet and obtains the MTU configured on the interface. Then the IP layer compares the MTU with the packet length. If the packet length is longer than the MTU, the IP layer fragments the packet into smaller packets, which are shorter than or equal to the MTU.

If unfragmentation is configured, some packets may be discarded during data transmission at the IP layer. To prevent packet loss on the network, large packets must be forcibly fragmented. The **mtu** command is used to set the size of a fragment.

Precautions

If you run the **mtu** command multiple times in the same ISDN BRI interface view, only the latest configuration takes effect.

Follow-up Procedure

Run the **shutdown** and **undo shutdown**/**restart** commands to restart the related physical interface to make the configuration take effect.

Example

Set the MTU of an ISDN BRI interface to 1200 bytes.

```
<Huawei> system-view
[Huawei] interface bri 1/0/0
[Huawei-Bri1/0/0] mtu 1200
[Huawei-Bri1/0/0] restart
```

 Copyright © Huawei Technologies Co., Ltd.

5.12.5 set workmode bri

Function

The **set workmode bri** command sets the working mode of a 2BST voice card.

By default, a 2BST voice card works in Network Termination (NT) mode.

Format

set workmode slot *slot-id* **bri bri-voice** { **nt-mode** | **te-mode** }

Parameters

Parameter	Description	Value
slot *slot-id*	Specifies the slot ID of a 2BST voice card.	Run the **display device** command to view slot IDs and types of interface cards and find the slot ID with 2BST displayed. Then run the **display workmode** command to view the interface card work mode on the device.
bri-voice { **nt-mode** | **te-mode** }	Indicates the working mode of a 2BST voice card. • **nt-mode**: The 2BST voice card works in NT mode. • **te-mode**: The 2BST voice card works in Terminal Equipment (TE) mode.	-

Views

System view

Default Level

3: Management level

Usage Guidelines

Usage Scenario

The device can function as the ISDN user-side or network-side device.

- When the device functions as the ISDN user-side device, configure the 2BST voice card to work in TE mode.
- When the device functions as the ISDN network-side device, configure the 2BST voice card to work in NT mode.

Copyright © Huawei Technologies Co., Ltd.

Precautions

After this command is executed, the configured service takes no effect.

After this command is used, the system prompts you to reset the 2BST voice card to make the new working mode take effect. If you select **Yes**, the system resets the interface card. Otherwise, you need to run the **reset slot** command to manually reset the interface card to make the new working mode take effect.

Example

Configure the 2BST voice card in slot 2 to work in TE mode.

```
<Huawei> system-view
[Huawei] set workmode slot 2 bri bri-voice te-mode
Warning: Changing the working mode will reset the board in slot 2. Continue? [y/
n]:y
INFO: Resetting board[2] succeeded.
```

Related Topics

4.1.3 display device

5.5.9 display workmode

4.2.13 reset slot

5.12.6 shutdown (ISDN BRI interface view)

Function

Using the **shutdown** command, you can shut down an ISDN BRI interface.

Using the **undo shutdown** command, you can enable an ISDN BRI interface.

By default, an ISDN BRI interface is enabled.

Format

shutdown

undo shutdown

Parameters

None

Views

ISDN BRI interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Copyright © Huawei Technologies Co., Ltd.

After modifying parameters of an ISDN BRI interface, run the **shutdown** and **undo shutdown** commands on the interface for the modifications to take effect.

When an ISDN BRI interface is not connected to a cable, run the **shutdown** command to shut down the interface to prevent interference.

Precautions

- Data frames may be lost if you disable an interface during data transmission. Exercise caution when you use the **shutdown** command.
- Running the **shutdown** and **undo shutdown** commands is equivalent to running the **restart** command.

Example

Shut down an ISDN BRI interface.

```
<Huawei> system-view
[Huawei] interface bri 1/0/0
[Huawei-Bri1/0/0] shutdown
```

Related Topics

5.12.2 display interface bri

5.13 POS Interface Commands

5.13.1 clock (POS interface view)

Function

The **clock** command sets the clock mode of a POS interface.

The **undo lock** command restores the default setting.

By default, a POS interface works in slave clock mode.

Format

clock { **master** | **slave** | **system** }

undo clock

Parameters

Parameter	Description	Value
master	Configures a POS interface to work in master clock mode.	-
slave	Configures a POS interface to work in slave clock mode.	-
system	Configures a POS interface to work in system clock mode.	-

Copyright © Huawei Technologies Co., Ltd.

Views

POS interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

To exchange data correctly, communicating parties must work in clock synchronization state.

A POS interface supports the following clock modes:

- master: uses the internal clock signal.
- slave: uses the line clock signal.
- system: uses the MPU clock signal.

Precautions

When the POS interfaces of the router and a remote device are directly connected, set the clock mode of one end to master and that of the peer end to slave.

When the POS interface of the router is connected to the SONET or SDH network, set the clock mode of the POS interface to slave because the SONET or SDH network clock has a higher accuracy than the POS interface.

When the MPU on the router obtains the clock with high accuracy from the upstream device and the router needs to synchronize the clock to downstream device, the interface on the router must be configured to work in system clock mode. Moreover, the interface on the downstream device must be configured to work in slave clock mode.

Example

Sets the clock mode to master on POS 2/0/0.

```
<Huawei> system-view
[Huawei] interface pos 2/0/0
[Huawei-Pos2/0/0] clock master
```

Related Topics

5.13.3 display interface pos

5.13.2 crc (POS interface view)

Function

The **crc** command sets the CRC field length of a POS interface.

The **undo crc** restores the default setting.

By default, the CRC field length is 32 bits.

 Copyright © Huawei Technologies Co., Ltd.

Format

crc { **16** | **32** }

undo crc

Parameters

Parameter	Description	Value
16	Sets the CRC field length to 16 bits.	-
32	Sets the CRC field length to 32 bits.	-

Views

POS interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

A POS interface supports 16-bit and 32-bit CRC fields. CRC checks the data consistency and uses a complex calculation with high accuracy. A 32-bit field can achieve higher accuracy than a 16-bit field but uses more resources.

Precautions

Ensure that the same CCR field length is configured for both devices on the link. Otherwise, the two devices cannot be connected.

Example

Set the CRC field length to 16 bits on POS 2/0/0.

```
<Huawei> system-view
[Huawei] interface pos 2/0/0
[Huawei-Pos2/0/0] crc 16
```

Related Topics

5.13.3 display interface pos

5.13.3 display interface pos

Function

The **display interface pos** command displays the configuration and status of a POS interface.

Copyright © Huawei Technologies Co., Ltd.

Format

display interface pos [*interface-number*]

Parameters

Parameter	Description	Value
interface-number	Specifies the POS interface ID. If no interface ID is specified, the configuration and status of all POS interfaces are displayed.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

To monitor the interface status or locate faults on an interface, run the **display interface pos** command to obtain the status of the interface. You can collect traffic statistics and locate faults on the interface according to the command output.

Example

Display the configuration and status of POS 2/0/0.

```
<Huawei> display interface pos 2/0/0
Pos2/0/0current state : UP
Line protocol current state : UP
Description:HUAWEI, AR Series, Pos2/0/0Interface
Route Port,The Maximum Transmit Unit is 1500, Hold timer is 10(sec)
Internet Address is 10.1.1.1/24
Link layer protocol is PPP
LCP opened, IPCP opened
Last physical up time   : 2012-08-09 17:25:11
Last physical down time : 2012-08-09 17:25:09
Current system time: 2012-08-09 19:33:13
  Frame-format is Sonet,
  Source Clock is Slave,
  Source Loopback is Not Set.
  Tx: J0: 25, J1: NULL, C2: 0x16
  Rx: J0: 25, J1: NULL, C2: 0x16
Regenerator section:
  Alarm: none
  Error: 0 BIP
Multiplex section:
  Alarm: none
  Error: 0 BIP, 0 REI
Higher order path(VC-4-1):
  Alarm: none
  Error: 65532 BIP, 0 REI
Last 300 seconds input rate 16 bits/sec 0 packets/sec
Last 300 seconds output rate 97888600 bits/sec 8223 packets/sec
```

 Copyright © Huawei Technologies Co., Ltd.

```
Input: 145902099 packets, 119450564927 bytes
  Total error:              0,    CRC:                   0
  Giants:                   0,    Runts:                 0
Output: 218481195 packets, 115763190175 bytes
  Total error:              0
    Input bandwidth utilization  : 0.01%
    Output bandwidth utilization :   63%
```

Table 5-44 Description of the display interface pos command output

Item	Description
Pos2/0/0 current state	Physical status of POS 2/0/0 • UP: The interface is physically Up. • DOWN: The interface has a fault. • Administratively DOWN: The administrator uses the **shutdown** command on the interface.
Line protocol current state	Link-layer protocol status of the interface • UP: The link-layer protocol of the interface is in the Up state. • DOWN: The link-layer protocol of the interface is in the Down state or no IP address is assigned to the interface.
Description	Description of the interface The description contains a maximum of 242 case-sensitive characters, with spaces supported.
The Maximum Transmit Unit	MTU of the interface
Hold timer	Polling interval of the interface
Internet Address is	IP address and mask of the interface The value is displayed in either of the following formats: • For a statically configured IP address: Internet Address is 1.1.1.1/24 • For an IP address allocated by DHCP: Internet Address is allocated by DHCP, 1.1.1.1/24
Link layer protocol is	Link-layer protocol of the interface • FR • PPP • HDLC
LCP reqsent	LCP negotiation being request for sending
Last physical up time	Last time the interface went Up physically If the value of this field is displayed as "-", the physical status of the interface does not change.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Last physical down time	Last time the interface went Down physically If the value of this field is displayed as "-", the physical status of the interface does not change.
Frame-format	Frame format
Source Clock	Clock mode
Source Loopback	Whether to configure loopback detection
Tx: J0: NULL, J1: NULL, C2: 0x16	Sent overhead bytes
Rx: J0: NULL, J1: NULL, C2: 0x0	Received overhead bytes

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
Alarm	Traps. • Loss of Signal (LOS): The LOS state is declared when the bit error rate (BER) is larger than 10e-3 because the input optical power is zero, too low, or too high. LOS is also detected when an all-0s or an all-1s pattern on the incoming SONET signal lasts 20 (+/-3) microseconds or longer. The LOS alarm is removed when two consecutive valid framing patterns (A1, A2) are received within the specified period. • Out of Frame (OOF): The OOF alarm is generated when five or more consecutive received frames (625 microseconds) contain no correct A1 and A2 bytes. • Loss of Frame (LOF): The LOF alarm is generated when an OOF defect on the incoming SONET signal persists for 3 milliseconds. The LOF alarm is cleared when frames received by the receiving terminal contain correct A1 and A2 bytes within 1 millisecond. • Trace Identifier Mismatch (TIM): The TIM alarm is generated on the receiving terminal when the values of J0 and J1 bytes in received frames differ from the expected values. After a TIM alarm is generated, the receiving terminal sends an RDI trap to the receiving terminal to indicate the defect on the remote end. The TIM alarm is cleared when the values are the same as the expected values. • Alarm Indication Signal (AIS): The line AIS (LAIS) alarm is received on the local terminal when it receives three or five consecutive frames whose K2 byte (bit 6 to bit 8) is 111. After receiving an LAIS alarm, the local terminal must send an LRDI trap to the remote terminal. The LAIS alarm is cleared when the local terminal receives three or five consecutive frames whose K2 byte (bit 6 to bit 8) is not 111. When the local terminal receives three consecutive frames containing AIS_ind, a path AIS (PAIS) is generated. When an AIS alarm is generated, the protocol status changes to Down, causing packet transmission interruption.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
	• Remote Defect Indication (RDI): The receiving terminal sends an RDI trap to the sending terminal to inform it of signal degrade. • Loss of Pointer (LOP): The LOP alarm is generated when the receiving terminal receives eight consecutive frames containing invalid pointers or new data flags (NDFs). After receiving the LOP alarm, the receiving terminal sends an RDI trap to the sending terminal to inform it of the defect. • Payload Label Mismatch (PLM): The PLM alarm is generated on the receiving terminal when the values of C2 byte in the received frame differs from the expected value. After receiving a PLM alarm, the receiving terminal sends an RDI trap to the sending terminal to indicate the defect on the peer end. • Unequipped (UNEQ): The UNEQ alarm is generated when C2 bytes in the received five consecutive frames are all 0s.
Last 300 seconds input rate	Packet receiving rate (bits per second and packets per second) in the last 300 seconds
Last 300 seconds output rate	Packet sending rate (bits per second and packets per second) in the last 300 seconds
Input	Total number of received packets
Output	Total number of sent packets
Input bandwidth utilization	Inbound bandwidth usage
Output bandwidth utilization	Outbound bandwidth usage

Related Topics

5.13.6 link-protocol (POS interface view)

5.13.4 flag (POS interface view)

Function

The **flag** command sets the overhead bytes for a SONET/SDH frame.

Copyright © Huawei Technologies Co., Ltd.

The **undo flag** command restores the default setting.

The default overhead bytes for the SDH are used: The C2 overhead byte is 0x16; J0 and J1 overhead bytes are blank.

Format

flag c2 *c2-value*

flag j0 { **1byte-mode** *value* | **16byte-mode** *value* | **64byte-mode** *value* }

flag j1 { **1byte-mode** *value* | **16byte-mode** *value* | **64byte-mode** *value* }

undo flag { **c2** | **j0** | **j1** }

Parameters

Parameter	Description	Value
c2 *c2-value*	Specifies the path signal label byte. It is contained in the higher-order path overhead and is used to specify the multiplexing structure and the attribute of the information payload in a Virtual Container (VC) frame.	The value is an integer that ranges from 0 to 255.
j0	Specifies the regeneration section trace byte. It is contained in the RSOH and is used to detect the continuity of a connection between two interfaces on the section.	-
j1	Specifies the Higher-Order VC-N path trace byte. It is carried in the higher-order path overhead and is used to detect the continuity of the connection between two interfaces on a channel.	-
1byte-mode *value*	Indicates that the J0/J1 overhead byte mode is 1byte-mode.	The value is a string of 1 character.
16byte-mode *value*	Indicates that the J0/J1 overhead byte mode is 16byte-mode.	The value is a string of 1 to 15 characters.
64byte-mode *value*	Indicates that the J0/J1 overhead byte mode is 64byte-mode	The value is a string of 1 to 62 characters.

Views

POS interface view

 Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

SDH frames contain various overhead bytes that are used to implement operation and maintenance functions such as layered management of SDH transport networks. J1, J0, and C2 are used for interoperatability between devices of different countries, areas, or manufacturers.

Precautions

C2, J0, and J1 at the receive and transmit ends should be the same; otherwise, the two ends fail to communicate.

Example

Set the overhead byte J0.

```
<Huawei> system-view
[Huawei] interface pos 2/0/0
[Huawei-Pos2/0/0] flag j0 16byte-mode aabb
```

Related Topics

5.13.3 display interface pos

5.13.5 frame-format (POS interface view)

Function

The **frame-format** command sets the frame format for a POS interface.

The **undo frame-format** command restores the default setting.

By default, the frame format is SDH.

Format

frame-format { **sdh** | **sonet** }

undo frame-format

Parameters

Parameter	Description	Value
sdh	Sets the frame format to SDH.	-
sonet	Sets the frame format to SONET.	-

Views

POS interface view

 Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

SDH and SONET are different standards defined by different organizations, but their content and functions are similar. SDH is mainly used in Europe and China and SONET is mainly used in North America and Japan. Different device manufacturers provide different default configurations for them.

Configure the POS interface frame format based on the standard used locally.

Precautions

Ensure that the frame format is the same on both ends.

There is a fixed 4-byte interframe gap (IFG) on a POS interface.

Example

Set the frame format to SONET on POS 2/0/0.

```
<Huawei> system-view
[Huawei] interface pos 2/0/0
[Huawei-Pos2/0/0] frame-format sonet
```

Related Topics

5.13.3 display interface pos

5.13.6 link-protocol (POS interface view)

Function

The **link-protocol** command sets the link-layer protocol for a POS interface.

The **undo link-protocol** command restores the default setting.

By default, the link-layer protocol of a POS interface is PPP.

Format

link-protocol { **fr** | **hdlc** | **ppp** }

undo link-protocol { **fr** | **hdlc** }

Parameters

Parameter	Description	Value
fr	Sets the link-layer protocol of the interface to FR.	-
hdlc	Sets the link-layer protocol of the interface to HDLC.	-

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
ppp	Sets the link-layer protocol of the interface to PPP.	-

Views

POS interface view

Default Level

2: Configuration level

Usage Guidelines

The link-layer protocol of a POS interface can be FR, PPP or HDLC. The protocol parameters can be set only after the link-layer protocol is set correctly.

Example

Set the link-layer protocol of POS 2/0/0 to HDLC.

```
<Huawei> system-view
[Huawei] interface pos 2/0/0
[Huawei-Pos2/0/0] link-protocol hdlc
Warning: The encapsulation protocol of the link will be changed.
Continue? [Y/N]:y
```

Related Topics

5.13.3 display interface pos

5.13.7 loopback (POS interface view)

Function

The **loopback** command enables loopback detection on a POS interface and sets the detection mode.

The **undo loopback** command restores the default setting.

By default, loopback detection is disabled on a POS interface.

Format

loopback { **local** | **remote** }

undo loopback

Parameters

Parameter	Description	Value
local	Specifies internal loopback.	-
remote	Specifies remote loopback.	-

Copyright © Huawei Technologies Co., Ltd.

Views

POS interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

POS provides different loopback functions to diagnose faults on the interface or connection cable. Normally, the loopback function should not be enabled.

Precautions

- Loopback can be enabled only for POS interfaces using the master clock mode. Otherwise, the POS interface cannot be connected.
- When loopback is enabled for a POS interface, the physical status is Up and the link-layer protocol status is Down if the link-layer protocol is PPP or FR, and the physical status and link-layer protocol status are both Up if the link-layer protocol is HDLC.

Example

Enable internal loopback on POS 2/0/0.

```
<Huawei> system-view
[Huawei] interface pos 2/0/0
[Huawei-Pos2/0/0] loopback local
```

Related Topics

5.13.3 display interface pos

5.13.8 mtu (POS interface view)

Function

The **mtu** command sets the maximum transmission unit (MTU) for a POS interface.

The **undo mtu** command restores the default setting.

By default, the MTU of a POS interface is 1500 bytes.

Format

mtu *mtu*

undo mtu

 Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
mtu	Sets the MTU for a POS interface.	The value is an integer and the value depends on the device, in bytes.

Views

POS interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The size of data frames is limited at the network layer. Any time the IP layer receives an IP packet to be sent, it checks to which local interface the packet needs to be sent and obtains the MTU configured on the interface. Then, the IP layer compares the MTU with the packet length. If the packet length is longer than the MTU, the IP layer disassembles the packet to fragments, each not longer than the MTU.

If forcible unfragmentation is configured, some packets may be discarded during data transmission at the IP layer. Therefore, large packets must be forcibly fragmented to prevent packet loss on the network. The **mtu** command sets the size of a fragment.

Precautions

- If you run the **mtu** command multiple times in the same POS interface view, only the latest configuration takes effect.
- After changing the MTU on an interface using the **mtu** command, run the **shutdown** and **undo shutdown**/**restart** command in the interface view to restart the interface for the configuration to take effect.

Example

Set the MTU of POS 2/0/0 to 1200.

```
<Huawei> system-view
[Huawei] interface pos 2/0/0
[Huawei-Pos2/0/0] mtu 1200
[Huawei-Pos2/0/0] restart
```

Related Topics

5.13.3 display interface pos

 Copyright © Huawei Technologies Co., Ltd.

5.13.9 scramble (POS interface view)

Function

The **scramble** command enables a POS interface to scramble payload data.

The **undo scramble** command disables the scrambling function.

By default, the scrambling function is enabled.

Format

scramble

undo scramble

Parameters

None

Views

POS interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

To avoid long consecutive 1 and 0 and allow the receiver to extract clock signals, a POS interface supports scrambling of payload data.

Precautions

NOTICE

Ensure that the same scrambling function is configured for both devices on the link. Otherwise, the two devices cannot be connected.

Example

Disable a POS interface from scrambling payload data.

```
<Huawei> system-view
[Huawei] interface pos 2/0/0
[Huawei-Pos2/0/0] undo scramble
```

Related Topics

5.13.3 display interface pos

Copyright © Huawei Technologies Co., Ltd.

5.13.10 set workmode stm

Function

The **set workmode stm** command sets the working mode of a 4STM1 interface card.

By default, a 4STM1 interface card works in **stm1** mode, that is, it provides four interfaces working at the rate of 155 Mbit/s.

Format

set workmode slot *slot-id* **stm** { **stm4** | **stm1** }

Parameters

Parameter	Description	Value
slot *slot-id*	Specifies the slot ID of a 4STM1 interface card.	Run the **display device** command to view slot IDs and types of interface cards, find the slot ID with 4STM1 displayed.
stm4	Sets the working mode to **stm4**, that is, only the POS optical interface numbered 0 and working at the rate of 622 Mbit/s is available. The other interfaces numbered 1 to 3 are unavailable.	-
stm1	Sets the working mode to **stm1**, that is, four POS optical interfaces working at the rate of 155 Mbit/s are available.	-

Views

System view

Default Level

3: Management level

Usage Guidelines

Usage Scenario

If a 4STM1 interface card connects to an SDH network, the 4STM1 interface card provides four interfaces working at the rate of 155 Mbit/s or one interface working at the rate of 622 Mbit/s. You can run this command to set the working mode of a 4STM1 interface card.

Precautions

Copyright © Huawei Technologies Co., Ltd.

After running this command, reset the card to make the configuration take effect. You can reset the card as prompted or run the **reset slot** command to manually reset the card.

You can run the **display workmode** command to view the working mode of a 4STM1 interface card.

Example

Configure the 4STM1 interface card in slot 2 to work in stm1 mode.

```
<Huawei> system-view
[Huawei] set workmode slot 2 stm stm4
Warning: Changing the working mode will reset the board in slot 2. Continue? [y/
n]:y
INFO: Resetting board[2] succeeded.
```

Related Topics

4.1.3 display device

5.5.9 display workmode

5.13.11 threshold (POS interface view)

Function

The **threshold** command sets SD and SF alarm thresholds for a POS interface.

The **undo threshold** command restores the default setting.

The default Signal Degrade (SD) log threshold is 10e-6 and the default SF log threshold is 10e-3.

Format

threshold { **sd** | **sf** } *value*

undo threshold { **sd** | **sf** }

Parameters

Parameter	Description	Value
sd *value*	Specifies the SD alarm threshold.	The threshold is in the format 10e-*value* and *value* is an integer ranging from 3 to 9.
sf *value*	Specifies the SF alarm threshold.	The threshold is in the format 10e-*value* and *value* is an integer ranging from 3 to 9.

Views

POS interface view

Default Level

2: Configuration level

Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

Usage Scenario

When link performance deteriorates, set the alarm thresholds on POS interfaces to learn link status.

- When link performance deteriorates a little, an SD alarm is reported.
- When link performance deteriorates greatly, an SF alarm is reported.

Precautions

The SD alarm threshold must be smaller than the SF alarm threshold.

Example

Set the SD alarm threshold to 10e-8 on POS 2/0/0.

```
<Huawei> system-view
[Huawei] interface pos 2/0/0
[Huawei-Pos2/0/0] threshold sd 8
```

Related Topics

5.13.3 display interface pos

5.14 CPOS Interface Configuration Commands

5.14.1 clock (CPOS interface view)

Function

The **clock** command sets the clock mode of a CPOS interface.

The **undo clock** command restores the default setting.

By default, a CPOS interface works in slave clock mode.

Format

clock { **master** | **slave** | **system** }

undo clock

Parameters

Parameter	Description	Value
master	Configures a CPOS interface to work in master clock mode.	-
slave	Configures a CPOS interface to work in slave clock mode.	-
system	Configures a CPOS interface to work in system clock mode.	-

 Copyright © Huawei Technologies Co., Ltd.

Views

CPOS interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

To exchange data correctly, communicating parties must work in clock synchronization state.

A CPOS interface supports the following clock modes:

- master: uses the internal clock signal.
- slave: uses the line clock signal.
- system: uses the MPU clock signal.

Precautions

When CPOS interfaces of the route and a remote device are connected directly or connected using WDM, one CPOS interface should work in master clock mode and use internal clock signals, and the other CPOS interface should work in slave clock mode and use line clock signals.

When connecting to a SONET/SDH device, a CPOS interface must be configured with the slave clock mode because the clock on a SONET/SDH network is more accurate than the internal clock source on a CPOS interface.

When the MPU on the router obtains the clock with high accuracy from the upstream device and the router needs to synchronize the clock to downstream device, the interface on the router must be configured to work in system clock mode. Moreover, the interface on the downstream device must be configured to work in slave clock mode.

Example

Configure CPOS 1/0/0 to work in master clock mode.

```
<Huawei> system-view
[Huawei] controller cpos 1/0/0
[Huawei-Cpos1/0/0] clock master
```

Related Topics

5.14.3 display controller cpos

5.14.2 controller cpos

Function

The **controller cpos** command displays the CPOS interface view.

 Copyright © Huawei Technologies Co., Ltd.

Format

controller cpos *cpos-number*

Parameters

Parameter	Description	Value
cpos-number	Specifies the number of a CPOS interface. The value is in the format of slot ID/subcard ID/interface sequence number.	-

Views

System view

Default Level

2: Configuration level

Usage Guidelines

Before configuring parameters such as frame formats and overhead bytes for a CPOS interface, you must enter the CPOS interface view.

Example

Enter the interface view of CPOS 1/0/0.

```
<Huawei> system-view
[Huawei] controller cpos 1/0/0
[Huawei-Cpos1/0/0]
```

Related Topics

5.14.3 display controller cpos

5.14.3 display controller cpos

Function

The **display controller cpos** command displays the physical layer configuration of the CPOS interface and all E1/T1 channels.

Format

display controller [**cpos** [*cpos-number*]]

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
cpos-number	Displays the physical layer configuration of the CPOS interface with a specified number and all E1/T1 channels. The value is in the format of slot ID/subcard ID/interface sequence number. If the *cpos-number* parameter is not specified, physical layer configurations of all CPOS interfaces are displayed.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

When monitoring the interface status or identifying the cause of the interface faults, you can run the **display controller cpos** command to obtain the status and statistics of the interface. According to the information, you can measure the traffic and identify the fault.

Example

Display the physical layer configuration of CPOS1/0/0 and all E1/T1 channels.

```
<Huawei> display controller cpos 1/0/0
Cpos1/0/0 current state : UP
Description : HUAWEI, AR Series, Cpos1/0/0 Interface
  Frame-format SDH, multiplex AU-3, clock master, loopback not set
  Tx: J0: 0x1, J1: "NetEngine", C2: 0x2
  Rx: J0: 0x1, J1: "NetEngine", C2: 0x2
Regenerator section:
  Alarm: none
  Error: 0 BIP
Multiplex section:
  Alarm: none
  Error: 0 BIP, 0 REI
Higher order path (VC-3-1):
  Alarm: none
  Error: 0 BIP, 0 REI
Higher order path (VC-3-2):
  Alarm: none
  Error: 0 BIP, 0 REI
Higher order path (VC-3-3):
  Alarm: none
  Error: 0 BIP, 0 REI
Cpos1/0/0  CT1 1  is up
  Frame-format ESF, clock master, loopback not set
Cpos1/0/0  CT1 2  is up
  Frame-format ESF, clock master, loopback not set
Cpos1/0/0  CT1 3  is up
  Frame-format ESF, clock master, loopback not set
 (here omitted some output information)
```

 Copyright © Huawei Technologies Co., Ltd.

```
Cpos1/0/0  CT1 83  is up
  Frame-format ESF, clock master, loopback not set
Cpos1/0/0  CT1 84  is up
  Frame-format ESF, clock master, loopback not set
```

Table 5-45 Description of the **display controller cpos** command output

Item	Description
Cpos1/0/0 current state:	Indicates the current physical status of the CPOS interface.
Description	Description of the CPOS interface. The value is a maximum of 242 case-sensitive characters with spaces. The description helps users learn about the functions of the CPOS interface.
Frame-format SDH, multiplex AU-3, clock master, loopback not set	Indicates the physical layer information of the CPOS interface: • The format of frames is SDH. To set the frame format, run the **frame-format** command. • AU-3 multiplexing path is adopted. To set the multiplexing mode, run the **multiplex mode** command. • The master clock mode is adopted, that is, internal clock signals are used. To set the clock mode, run the **clock** command. • The loopback function is disabled. To configure the loopback function, run the **loopback** command.
Tx: J0: 0x1, J1: "NetEngine", C2: 0x2	Indicates the sent overhead bytes. To set the overhead byte, run the **flag** command.
Rx: J0: 0x1, J1: "NetEngine", C2: 0x2	Indicates the received overhead bytes.
Regenerator section	Indicates the alarm and error statistics of the regenerator section.
Multiplex section	Indicates the alarm and error statistics of the multiplexing section.
Higher order path (VC-3-x)	Indicates the alarm and error statistics of the higher-order path. VC-3-x indicates VC-3 numbered x. When AU-3 multiplexing path is adopted, three VC-3s are multiplexed into one STM-1. Therefore, there are three higher-order paths. When AU-4 multiplexing path is adopted, there is only one higher-order path VC-4.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Alarm	Indicates the alarm statistics. • Loss of Signal (LOS): The LOS alarm is generated when data transmission is interrupted or frames are lost because of severe problems, for example, there is no transmit optical power, the transmit optical power is too high or too low, the cable is broken, or the cable is not properly connected. • Out of Frame (OOF): The OOF alarm is generated when five or more consecutive received frames (625 microseconds) contain no correct A1 and A2 bytes. • Loss of Frame (LOF): The LOF alarm is generated when an OOF defect on the incoming SONET signal persists for 3 milliseconds. • Trace Identifier Mismatch (TIM): The TIM alarm is generated on the receiving terminal when the values of J0 and J1 bytes in received frames differ from the expected values. After a TIM alarm is generated, the receiving terminal sends an RDI trap to the receiving terminal to indicate the defect on the remote end. The TIM alarm is cleared when the values are the same as the expected values. • Alarm Indication Signal (AIS): The line AIS (LAIS) alarm is received on the local terminal when it receives three or five consecutive frames whose K2 byte (bit 6 to bit 8) is 111. After receiving an LAIS alarm, the local terminal must send an LRDI trap to the remote terminal. The LAIS alarm is cleared when the local terminal receives three or five consecutive frames whose K2 byte (bit 6 to bit 8) is not 111. When the local terminal receives three consecutive frames containing AIS_ind, a path AIS (PAIS) is generated. When an AIS alarm is generated, the protocol status changes to Down, causing packet transmission interruption.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
	• Remote Defect Indication (RDI): The receiving terminal sends an RDI trap to the sending terminal to inform it of signal degrade. • Loss of Pointer (LOP): The LOP alarm is generated when the receiving terminal receives eight consecutive frames containing invalid pointers or new data flags (NDFs). After receiving the LOP alarm, the receiving terminal sends an RDI trap to the sending terminal to inform it of the defect. • Payload Label Mismatch (PLM): The PLM alarm is generated on the receiving terminal when the value of C2 byte in the received frame differs from the expected value. After receiving a PLM alarm, the receiving terminal sends an RDI trap to the sending terminal to indicate the defect on the peer end. • Unequipped (UNEQ): The UNEQ alarm is generated when C2 bytes in the received five consecutive frames are all 0s.
Error	Indicates the error statistics. Possible error types are as follows: • BIP: is short for bit-interleaved parity • REI: is short for remote error indication
Cpos1/0/0 CT1 1 is up	Indicates the status of T1 channel 1 of CPOS 1/0/0.
Frame-format ESF, clock master, loopback not set	Indicates the physical layer information of the T1 channel: • The format of frames is ESF. • The master clock mode is adopted, that is, internal clock signals are used. • The loopback function is disabled.

Related Topics

5.14.4 display controller cpos e1

5.14.5 display controller cpos t1

Copyright © Huawei Technologies Co., Ltd.

5.14.4 display controller cpos e1

Function

The **display controller cpos e1** command displays the physical layer configuration of the specified E1 channel of the specified CPOS interface.

Format

display controller cpos *cpos-number* **e1** *e1-number*

Parameters

Parameter	Description	Value
cpos-number	Displays the physical layer configuration of a specified CPOS interface. The value is in the format of slot ID/subcard ID/interface sequence number.	-
e1-number	Displays the physical layer configuration of a specified E1 channel of a specified CPOS interface.	The value is an integer that ranges from 1 to 63.

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

Compared with the **display controller cpos** command, the **display controller cpos e1** command displays the error and alarm information of the lower-order path, the multiplexing path of the E1 channel, and E1 channel multiplexing path.

Example

Display the status of E1 channel 1 of CPOS 1/0/0.

```
<Huawei> display controller cpos 1/0/0 e1 1
Cpos1/0/0 current state : UP
Description : HUAWEI, AR Series, Cpos1/0/0 Interface
  Frame-format SDH, multiplex AU-4, clock master, loopback not set
  Tx: J0: 0x1, J1: NULL, C2: 0x2
  Rx: J0: NULL, J1: NULL, C2: 0x0
Regenerator section:
  Alarm: none
  Error: 0 BIP
Multiplex section:
  Alarm: none
  Error: 0 BIP, 0 REI
Higher order path (VC-4-1):
```


Copyright © Huawei Technologies Co., Ltd.

```
  Alarm: none
  Error: 0 BIP, 0 REI
Lower order path:
  Alarm: none
  Error: 0 BIP, 0 REI
Cpos1/0/0  CE1 1 is up
  Frame-format NO-CRC4, clock slave, loopback not set
E1 framer (1-1-1-1):
  Alarm: none
  Error: 0 CEC, 0 FEBC, 0 REC
```

Table 5-46 Description of the **display controller cpos e1** command output

Item	Description
Cpos1/0/0 current state	Indicates the current physical status of the CPOS interface.
Description	Indicates the description of the interface, which is case sensitive and support blank spaces. A maximum of 242 characters can be entered.
Frame-format SDH, multiplex AU-4, clock master, loopback not set	Indicates the physical layer information of the CPOS interface: • The format of frames is SDH. To set the frame format, run the **frame-format** command. • AU-3 multiplexing path is adopted. To set the multiplexing mode, run the **multiplex mode** command. • The master clock mode is adopted, that is, internal clock signals are used. To set the clock mode, run the **clock** command. • The loopback function is disabled. To configure the loopback function, run the **loopback** command.
Tx: J0: 0x1, J1: NULL, C2: 0x2	Indicates the sent overhead bytes. To set the overhead byte, run the **flag** command.
Rx: J0: NULL, J1: NULL, C2: 0x0	Indicates the received overhead bytes.
Regenerator section	Indicates the alarm and error statistics of the regenerator section.
Multiplex section	Indicates the alarm and error statistics of the multiplexing section.
Higher order path (VC-3-x)	Indicates the alarm and error statistics of the higher-order path. VC-4-1 indicates that AU-4 multiplexing path is adopted, and there is only one higher-order path VC-4.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
Alarm:Error	Indicates the alarm and error statistics. Possible error types are as follows: • BIP: is short for bit-interleaved parity. • REI: is short for remote error indication. • CEC: is short for cyclic redundancy check error counter. • FEBC: is short for frame bit error counter. • REC: is short for receive E-Bit counter.
Cpos1/0/0 CE1 1 is up	Indicates the current status of E1 channel 1 of CPOS 1/0/0.
E1 framer (1-1-1-1)	Indicates the process of multiplexing the E1 channel. 1-1-1-1 indicates the following respectively: • Number of VC-4 to which the E1 channel belongs • Number of TUG-3 to which the E1 channel belongs • Number of TUG-2 to which the E1 channel belongs • Number of TU-12 to which the E1 channel belongs

Related Topics

5.14.3 display controller cpos
5.14.5 display controller cpos t1

5.14.5 display controller cpos t1

Function

The **display controller cpos t1** command displays the physical layer configuration of the specified T1 channel of the specified CPOS interface.

Format

display controller cpos *cpos-number* **t1** *t1-number*

 Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
cpos-number	Displays the physical layer configuration of a specified CPOS interface. The value is in the format of slot ID/subcard ID/interface sequence number.	-
t1-number	Displays the physical layer configuration of a specified T1 channel of a specified CPOS interface.	The value is an integer that ranges from 1 to 84.

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

Compared with the **display controller cpos** command, the **display controller cpos t1** command displays the error and alarm information of the lower-order path, the multiplexing path of the E1 channel, and T1 multiplexing path.

Example

Display the status of T1 channel 2 of CPOS 1/0/0.

```
<Huawei> display controller cpos 1/0/0 t1 2
Cpos1/0/0 current state : UP
Description : HUAWEI, AR Series, Cpos1/0/0 Interface
  Frame-format SDH, multiplex AU-3, clock master, loopback not set
  Tx: J0: 0x1, J1: NULL, C2: 0x2
  Rx: J0: NULL, J1: NULL, C2: 0x0
Regenerator section:
  Alarm: none
  Error: 0 BIP
Multiplex section:
  Alarm: none
  Error: 0 BIP, 0 REI
Higher order path (VC-3-2):
  Alarm: none
  Error: 0 BIP, 0 REI
Lower order path:
  Alarm: none
  Error: 4095 BIP, 2047 REI
Cpos1/0/0  CT1 2 is up
  Frame-format ESF, clock master, loopback not set
T1 framer (2-1-1):
  Alarm: none
  Error: 0 CEC, 0 FEBC, 0 REC
```


Copyright © Huawei Technologies Co., Ltd.

Table 5-47 Description of the **display controller cpos t1** command output

Item	Description
Cpos1/0/0 current state:	Indicates the current physical status of the CPOS interface.
Description	Description of the CPOS interface. The value is a maximum of 242 case-sensitive characters with spaces. The description helps users learn about the functions of the CPOS interface.
Frame-format SDH, multiplex AU-3, clock master, loopback not set	Indicates the physical layer information of the CPOS interface: • The format of frames is SDH. To set the frame format, run the **frame-format** command. • AU-3 multiplexing path is adopted. To set the multiplexing mode, run the **multiplex mode** command. • The master clock mode is adopted, that is, internal clock signals are used. To set the clock mode, run the **clock** command. • The loopback function is disabled. To configure the loopback function, run the **loopback** command.
Tx: J0: 0x1, J1: NULL, C2: 0x2	Indicates the sent overhead bytes. To set the overhead byte, run the **flag** command.
Rx: J0: NULL, J1: NULL, C2: 0x0	Indicates the received overhead bytes.
Regenerator section	Indicates the alarm and error statistics of the regenerator section.
Multiplex section	Indicates the alarm and error statistics of the multiplexing section.
Higher order path (VC-3-2)	Indicates the alarm and error statistics of the higher-order path. VC-3-2 indicates the VC-3 numbered 2.
Lower order path:	Indicates the alarm and error statistics of the lower-order path.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Alarm:Error	Indicates the alarm statistics and error statistics. Possible error types are as follows: • BIP: is short for bit-interleaved parity. • REI: is short for remote error indication. • CEC: is short for cyclic redundancy check error counter. • FEBC: is short for frame bit error counter. • REC: is short for receive E-Bit counter.
Cpos1/0/0 CT1 2 is up	Indicates the current status of T1 channel 1 of CPOS 1/0/0.
Frame-format ESF, clock master, loopback not set	Indicates the physical layer information of the T1 channel: • The format of frames is ESF. • The master clock mode is adopted, that is, internal clock signals are used. • The loopback function is disabled.
T1 framer (2-1-1)	Indicates the process of multiplexing the T1 channel. 2-1-1 indicates the following respectively: • Number of VC-3 to which the T1 channel belongs • Number of TUG-2 to which the T1 channel belongs • Number of TU-11 to which the T1 channel belongs

Related Topics

5.14.3 display controller cpos
5.14.4 display controller cpos e1

5.14.6 display cpos multi-channel

Function

The **display cpos multi-channel** command displays the multiplexing path tributary unit groups (TUGs) of an E1 or a T1 channel.

Format

display cpos { **e1–data** | **t1–data** } **multi-channel align-mode**

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
e1–data	Displays the multiplexing path tributary unit groups (TUGs) of an E1 channel.	-
t1–data	Displays the TUGs of a T1 channel.	-
multi-channel align-mode	Sets the connection mode in which a CPOS interface connects to a remote device.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

The **display cpos multi-channel** command displays the multiplexing path TUGs of an E1 or a T1 channel.

Example

Display the multiplexing path TUGs of an E1 channel.

```
<Huawei> display cpos e1-data multi-channel align-mode
TUG-3  TUG-2  TU-12  Huawei  Lucent  Alcatel
  1      1      1      1       1       1
  2      1      1      2      22      22
  3      1      1      3      43      43
  1      2      1      4       4       2
  2      2      1      5      25      23
  3      2      1      6      46      44
  1      3      1      7       7       3
  2      3      1      8      28      24
  3      3      1      9      49      45
  1      4      1     10      10       4
  2      4      1     11      31      25
  3      4      1     12      52      46
  1      5      1     13      13       5
  2      5      1     14      34      26
  3      5      1     15      55      47
  1      6      1     16      16       6
  2      6      1     17      37      27
  3      6      1     18      58      48
  1      7      1     19      19       7
  2      7      1     20      40      28
  3      7      1     21      61      49
  1      1      2     22       2       8
  2      1      2     23      23      29
  3      1      2     24      44      50
  1      2      2     25       5       9
  2      2      2     26      26      30
  3      2      2     27      47      51
  1      3      2     28       8      10
  2      3      2     29      29      31
  3      3      2     30      50      52
  1      4      2     31      11      11
```


Copyright © Huawei Technologies Co., Ltd.

```
2    4    2    32    32    32
3    4    2    33    53    53
1    5    2    34    14    12
2    5    2    35    35    33
3    5    2    36    56    54
1    6    2    37    17    13
2    6    2    38    38    34
3    6    2    39    59    55
1    7    2    40    20    14
2    7    2    41    41    35
3    7    2    42    62    56
1    1    3    43    3     15
2    1    3    44    24    36
3    1    3    45    45    57
1    2    3    46    6     16
2    2    3    47    27    37
3    2    3    48    48    58
1    3    3    49    9     17
2    3    3    50    30    38
3    3    3    51    51    59
1    4    3    52    12    18
2    4    3    53    33    39
3    4    3    54    54    60
1    5    3    55    15    19
2    5    3    56    36    40
3    5    3    57    57    61
1    6    3    58    18    20
2    6    3    59    39    41
3    6    3    60    60    62
1    7    3    61    21    21
2    7    3    62    42    42
3    7    3    63    63    63
```

Table 5-48 Description of the display cpos multi-channel command output

Item	Description
TUG-3	Tributary unit group type 3.
TUG-2	Tributary unit group type 2.
TU-12	Tributary unit type 12.
Huawei	CPOS connection mode: Huawei mode.
Lucent	CPOS connection mode: Lucent mode.
Alcatel	CPOS connection mode: Alcatel mode.

Related Topics

5.14.18 multi-channel align-mode

5.14.7 e1 channel-set (CPOS interface view)

Function

The **e1 channel-set** command configures an E1 channel to work in channelized mode and bundles timeslots of E1 channel together.

The **undo e1 channel-set** command unbinds the timeslots.

Copyright © Huawei Technologies Co., Ltd.

By default, the device does not bundle timeslots of E1 channel.

Format

e1 *e1-number* **channel-set** *set-number* **timeslot-list** *slot-list*

undo e1 *e1-number* **channel-set** *set-number*

Parameters

Parameter	Description	Value
e1-number	Specifies the E1 channel number of CPOS.	The value ranges from 1 to 63.
set-number	Specifies the number of the channel-set.	The value ranges from 0 to 30.
timeslot-list *slot-list*	Specifies the timeslot number or the timeslot range.	The value ranges from 1 to 31. It can be separate timeslot or time ranges. Time slots are separated by ","; while the range is expressed by "-".

Views

CPOS interface view

Default Level

2: Configuration level

Usage Guidelines

The E1 channel of a CPOS interface can work in unchannelized or channelized mode.

- In unchannelized mode, an E1 channel works at a rate of 2 Mbit/s without timeslot division. The logical features of an E1 channel are the same as those of a synchronous serial interface.
- When an E1 channel works in channelized mode, the 2 Mbit/s transmission line is divided into 32 timeslots at a rate of 64 kbit/s. The 32 timeslots are numbered 0 to 31, and timeslot 0 transmits synchronization signals. Timeslots except timeslot 0 can be randomly bundled into a channel set that functions as an interface. The rate of the interface is N x 64 kbit/s, in which N is the number of timeslots bundled into a channel set. The interface has the same logical features as a synchronous serial interface.

In channelized mode, the name and number of an E1 channel is **serial** *interface-number*|*e1-number.set-number*. *interface-number* specifies the number of the CPOS interface, *e1-number* specifies the E1 channel number, and *set-number* specifies the number of the channel set.

 Copyright © Huawei Technologies Co., Ltd.

NOTE

To sure the system's processing capability, one CPOS interface can be bound with 512 logical channels at most.

Example

Configure E1 channel 63 to work in channelized mode and bundles timeslots of E1 channel 3 together.

```
<Huawei> system-view
[Huawei] controller cpos 1/0/0
[Huawei-Cpos1/0/0] e1 63 channel-set 1 timeslot-list 1-31
```

Enter the serial port (generated after the binding) view.

```
[Huawei-Cpos1/0/0] quit
[Huawei] interface serial 1/0/0/63:1
[Huawei-Serial1/0/0/63:1]
```

Related Topics

5.14.13 e1 unframed (CPOS interface view)

5.14.8 e1 set clock (CPOS interface view)

Function

The **e1 set clock** command sets the clock mode of E1.

The **undo e1 set clock** command restores the default setting.

By default, the clock mode of an E1 channel is slave.

Format

e1 *e1-number* **set clock** { **master** | **slave** }

undo e1 *e1-number* **set clock**

Parameters

Parameter	Description	Value
e1-number	Specifies the E1 channel number of CPOS.	The value ranges from 1 to 63 in integer.
master	Indicates the master clock.	-
slave	Indicates the slave clock.	-

Views

CPOS interface view

Default Level

2: Configuration level

Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

The clock modes of different E1 channels on the same CPOS port are independent of each other. The clock mode of the E1 channel must be different on both ends.

Example

Set the clock mode of the E1 channel 1 to master.

```
<Huawei> system-view
[Huawei] controller cpos 1/0/0
[Huawei-Cpos1/0/0] e1 1 set clock master
```

Related Topics

5.14.4 display controller cpos e1

5.14.9 e1 set flag (CPOS interface view)

Function

The **e1 set flag** command sets the overhead byte of an E1 channel.

The **undo e1 set flag** command restores the default setting.

By default, J2 repeatedly transmits a string of null characters, and the V5 byte value is 2.

Format

e1 *e1-number* **set flag** { **j2** { **1byte-mode** *1byte-string* | **16byte-mode** *16byte-string* } | **v5** *v5-string* }

undo e1 *e1-number* **set flag** { **j2** | **v5** }

Parameters

Parameter	Description	Value
e1-number	Specifies the E1 channel number of a CPOS interface.	The value is an integer that ranges from 1 to 63.
j2 1byte-mode *1byte-string*	Sets the 1-byte length trace format for the low-order path trace byte J2.	The value is a string of 1 character.
j2 16byte-mode *16byte-string*	Sets the 16-byte length trace format for the low-order path trace byte J2.	The value is a string of 1 to 15 characters.
v5 *v5-string*	Sets the low-order path signal label byte V5.	The value is an integer that ranges from 2 to 4.

Views

CPOS interface view

Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

The pathoverhead (POH) of E1 channels must be the same on both ends; otherwise, devices on both ends may not communicate properly.

Example

Set the V5 byte of E1 channel 1 on a CPOS interface to 3.

```
<Huawei> system-view
[Huawei] controller cpos 1/0/0
[Huawei-Cpos1/0/0] e1 1 set flag v5 3
```

Related Topics

5.14.4 display controller cpos e1

5.14.10 e1 set frame-format (CPOS interface view)

Function

The **e1 set frame-format** command configures the frame format of an E1 channel.

The **undo e1 set frame-format** command restores the default setting.

By default, no-CRC4 is used.

Format

e1 *e1-number* **set frame-format** { **crc4** | **no-crc4** }

undo e1 *e1-number* **set frame-format**

Parameters

Parameter	Description	Value
e1-number	Specifies the E1 channel number of CPOS.	The value ranges from 1 to 63 in integer.
crc4	Sets the frame format of the E1 channel to CRC4.	-
no-crc4	Sets the frame format of the E1 channel to no-CRC4.	-

Views

CPOS interface view

 Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The E1 channel channelized from CPOS interfaces supports frame formats: CRC4 and no-CRC4.

- CRC4: indicates that the frame format is a multi-frame. A multi-frame is formed by using the first bit of timeslot 0 and contains 16 consecutive PCM frames.
- Non-CRC4: indicates that the frame format is a basic frame. A basic frame is also called a dual-frame or an odd-even frame.

The multi-frame format supports CRC4, whereas the basic frame format does not support CRC4.

Precautions

The frame format on the local end must be the same as that on the remote end.

NOTE

If the **e1 unframed** command has been used, run the **undo e1 unframed** command to disable the E1 channel from working in unframed mode before running the **e1 set frame-format** command to configure the frame format for the E1 channel.

Example

Set the frame format of the E1 channel 1 to CRC4.

```
<Huawei> system-view
[Huawei] controller cpos 1/0/0
[Huawei-Cpos1/0/0] e1 1 set frame-format crc4
```

Related Topics

5.14.4 display controller cpos e1

5.14.11 e1 set loopback (CPOS interface view)

Function

The **e1 set loopback** command enables loopback detection of an E1 channel and sets the detection mode.

The **undo e1 set loopback** command disables the loopback detection of an E1 channel.

By default, the loopback detection of an E1 channel is disabled.

Format

e1 *e1-number* **set loopback** { **local** | **remote** }

undo e1 *e1-number* **set loopback**

 Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
e1-number	Specifies the E1 channel number of CPOS.	The value ranges from 1 to 63 in integer.
local	Sets an E1 channel to implement local loopback.	-
remote	Sets an E1 channel to implement remote loopback.	-

Views

CPOS interface view

Default Level

2: Configuration level

Usage Guidelines

The E1 channel provides a variety of loopback functions for tests on different levels.

- In the internal loopback, data at the sending end is looped back to the receiving end.
- In the external remote loopback, the received data is looped back without passing through the E1 framer and generating the payload.

When a loopback is enabled on an E1 channel, the loopback is valid for the synchronous serial interface formed by the E1 channel.

- When the link layer protocol of the synchronous serial interface is PPP, the physical status of the synchronous serial interface is Up; whereas the link layer protocol is Down.
- When the link layer protocol used by the synchronous serial interface is HDLC, the physical status and link layer status at both ends depend on the loopback mode:
  - In the internal loopback, the physical status of interfaces at both ends is Up. The link layer status of the sending end is Up, and that of the receiving end is Down.
  - In the external remote loopback, the physical status of interfaces at both ends is Up. The link layer status of the sending end is Down, and that of the receiving end is Up.

Example

Set the E1 channel 1 to perform the external remote loopback.

```
<Huawei> system-view
[Huawei] controller cpos 1/0/0
[Huawei-Cpos1/0/0] e1 1 set loopback remote
```

 Copyright © Huawei Technologies Co., Ltd.

Related Topics

5.14.4 display controller cpos e1

5.14.12 e1 shutdown (CPOS interface view)

Function

The **e1 shutdown** command disables an E1 channel.

The **undo e1 shutdown** command enables an E1 channel.

By default, an E1 channel is enabled.

Format

e1 *e1-number* **shutdown**

undo e1 *e1-number* **shutdown**

Parameters

Parameter	Description	Value
e1-number	Specifies the E1 channel number of CPOS.	The value ranges from 1 to 63 in integer.

Views

CPOS interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The **e1 shutdown** command disables an idle E1 channel.

Precautions

- After the **e1 shutdown** command is run on an E1 channel, the E1 channel and interfaces that timeslots are bound into are shut down and stop receiving and sending data. Data may be lost if you disable the E1 channel during data transmission. Exercise caution when you use the **shutdown** command.
- After the **undo shutdown** command is run on an E1 channel, the E1 channel and interfaces that timeslots are bound into go Up.

Example

Disable the E1 channel 1.

```
<Huawei> system-view
[Huawei] controller cpos 1/0/0
```

 Copyright © Huawei Technologies Co., Ltd.

```
[Huawei-Cpos1/0/0] e1 1 shutdown
```

Related Topics

5.14.4 display controller cpos e1

5.14.13 e1 unframed (CPOS interface view)

Function

The **e1 unframed** command configures an E1 channel to work in unchannelized mode and generates an interface working at a rate of 2 Mbit/s without timeslot division.

The **undo e1 unframed** command restores the default configuration.

By default, an E1 channel works in channelized mode.

Format

e1 *e1-number* **unframed**

undo e1 *e1-number* **unframed**

Parameters

Parameter	Description	Value
e1-number	Specifies the E1 channel number of CPOS.	The value is an integer that ranges from 1 to 63.

Views

CPOS interface view

Default Level

2: Configuration level

Usage Guidelines

The E1 channel of a CPOS interface can work in unchannelized or channelized mode.

- In unchannelized mode, an E1 channel works at a rate of 2 Mbit/s without timeslot division. The logical features of an E1 channel are the same as those of a synchronous serial interface.
- When an E1 channel works in channelized mode, the 2 Mbit/s transmission line is divided into 32 timeslots at a rate of 64 kbit/s. The 32 timeslots are numbered 0 to 31, and timeslot 0 transmits synchronization signals. Timeslots except timeslot 0 can be randomly bundled into a channel set that functions as an interface. The rate of the interface is N x 64 kbit/s. The interface has the same logical features as a synchronous serial interface.

Copyright © Huawei Technologies Co., Ltd.

In channelized mode, the name and number of interfaces formed by the E1 channel are **serial** *interface-number*/*e1-number*:**0**. *interface-number* specifies the number of the CPOS interface, and *e1-number* specifies the E1 channel number.

Example

Configure E1 channel 3 of CPOS 1/0/0 to operate in unframed mode.

```
<Huawei> system-view
[Huawei] controller cpos 1/0/0
[Huawei-Cpos1/0/0] e1 3 unframed
```

Display the E1 channel 3 interface view.

```
[Huawei]interface serial 1/0/0/3:0
[Huawei-Serial1/0/0/3:0]
```

Related Topics

5.14.3 display controller cpos

5.14.14 flag (CPOS interface view)

Function

The **flag** command sets the overhead byte of a SONET or SDH frame.

The **undo flag** command restores the default setting.

By default, the overhead byte C2 is 2, and the overhead byte S1 is 15.

Format

flag { **c2** *c2-value* | { **j0** | **j1** } { **1byte-mode** *1byte-string* | **16byte-mode** *16byte-string* | **64byte-mode** *64byte-string* } | **s1** *s1-string* }

undo flag { **c2** | **j0** | **j1** | **s1** }

Parameters

Parameter	Description	Value
c2 *c2-value*	Specifies the path signal label byte. It is contained in the higher-order path overhead and is used to specify the multiplexing structure and the attribute of the information payload in a Virtual Container (VC) frame.	The value is a decimal integer that ranges from 0 to 255. The default value is 2.
j0	Specifies the regeneration section trace byte. It is contained in the RSOH and is used to detect the continuity of a connection between two interfaces on the section.	-

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
j1	Specifies the Higher-Order VC-N path trace byte. It is carried in the higher-order path overhead and is used to detect the continuity of the connection between two interfaces on a channel.	-
1byte-mode *1byte-string*	Indicates that the J0/J1 overhead byte mode is 1-byte-mode.	The value is a string of 1 character.
16byte-mode *16byte-string*	Indicates that the J0/J1 overhead byte mode is 16-byte-mode.	The value is a string of 1 to 15 characters.
64byte-mode *64byte-string*	Indicates that the J0/J1 overhead byte mode is 64-byte-mode.	The value is a string of 1 to 62 characters.
s1 *s1-string*	Specifies the synchronization status byte S1.	The value is a decimal integer that ranges from 0 to 15.

Views

CPOS interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

A SONET or SDH frame has a variety of overhead bytes and can implement Operation and Maintenance (OAM) such as management of layers on the transmission network. C2, J1, J0 and S1 help devices from different countries, areas or manufacturers to communicate with each other.

Precautions

The values of C2, J0, J1, and S1 at the receive and transmit ends must be the same; otherwise, the two ends fail to communicate.

Example

Set the S1 byte of CPOS 1/0/0 to 10.

```
<Huawei> system-view
[Huawei] controller cpos 1/0/0
[Huawei-Cpos1/0/0] flag s1 10
```

Related Topics

5.14.3 display controller cpos

Copyright © Huawei Technologies Co., Ltd.

5.14.15 frame-format (CPOS interface view)

Function

Using the **frame-format** command, you can set the frame type used by CPOS.

Using the **undo frame-format** command, you can restore the default setting.

By default, SDH is used.

Format

frame-format { **sdh** | **sonet** }

undo frame-format

Parameters

Parameter	Description	Value
sdh	Sets the frame format of a CPOS interface to SDH.	-
sonet	Sets the frame format of a CPOS interface to SONET.	-

Views

CPOS interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

SDH and SONET are different standards defined by different organizations, but their content and functions are similar. SDH is mainly used in Europe and China and SONET is mainly used in North America and Japan. Different device manufacturers provide different default configurations for them.

Configure the CPOS interface frame format based on the standard used locally.

Precautions

The frame format of the CPOS interface must be the same on both ends.

Example

Set the frame format of CPOS1/0/0 to SONET.

```
<Huawei> system-view
[Huawei] controller cpos 1/0/0
[Huawei-Cpos1/0/0] frame-format sonet
```


Copyright © Huawei Technologies Co., Ltd.

Related Topics

5.14.3 display controller cpos

5.14.16 itf (CPOS interface view)

Function

The **itf** command sets the interframe filling tag and the number of interframe filling tags on a CPOS interface.

The **undo itf** command restores the default setting.

By default, a CPOS interface uses the interframe filling tag 0x7e and four interframe filling tags.

Format

itf { **number** *number* | **type** { **7e** | **ff** } }

undo itf { **number** | **type** }

Parameters

Parameter	Description	Value
number *number*	Specifies the number of interframe filling tags.	The value is an integer that ranges from 0 to 14.
type	Specifies the interframe filling tag.	-
7e	Sets the interframe filling tag to 0x7e.	-
ff	Sets the interframe filling tag to 0xff.	-

Views

CPOS interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The interframe filling tag is the code sent when the timeslot bundled to form a logical channel that belongs to an E1 or T1 Channel channelized by a CPOS interface does not send any service data.

A CPOS interface supports two interframe filling tags: 0x7e and 0xff. The default interframe filling tag 0x7e is recommended.

Copyright © Huawei Technologies Co., Ltd.

Precautions

- Two devices can communicate properly only when the same interframe filling tag and the same number of interframe filling tags are set on CPOS interfaces on both devices.
- E1/T1 Channels channelized by a CPOS interface cannot achieve the bandwidth because of extra costs of interframe filling tags. To improve the transmission rate of the CPOS interface, run the **itf number** command to set the number of interframe filling tags to 0.

Example

Set the interframe filling tag to 0xff on CPOS 1/0/0.

```
<Huawei> system-view
[Huawei] controller cpos 1/0/0
[Huawei-Cpos1/0/0] itf type ff
```

5.14.17 loopback (CPOS interface view)

Function

The **loopback** command enables loopback detection on a CPOS interface and sets the detection mode.

The **undo loopback** command restores the default setting.

By default, loopback detection is disabled on a CPOS interface.

Format

loopback { **local** | **remote** }

undo loopback

Parameters

Parameter	Description	Value
local	Specifies local loopback on a CPOS interface.	-
remote	Specifies remote loopback on a CPOS interface.	-

Views

CPOS interface view

Default Level

2: Configuration level

Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

CPOS provides loopback on different levels. The various loopback functions can be used to troubleshoot the ports or cables. In normal conditions, the loopback should be disabled.

NOTE

After the serial interface formed by the CPOS interface is encapsulated with the PPP protocol and the loopback is configured, the status of the link layer protocol is Down, which belongs to the normal case.

Example

Enable the remote loopback on CPOS 1/0/0.

```
<Huawei> system-view
[Huawei] controller cpos 1/0/0
[Huawei-Cpos1/0/0] loopback remote
```

Related Topics

5.14.3 display controller cpos

5.14.18 multi-channel align-mode

Function

The **multi-channel align-mode** command sets the connection mode in which a CPOS interface connects to a remote device.

The **undo multi-channel align-mode** command restores the default setting.

By default, the connection mode of a CPOS interface is Huawei.

Format

multi-channel align-mode { **alcatel** | **huawei** | **lucent** }

undo multi-channel align-mode

Parameters

Parameter	Description	Value
alcatel	Sets the connection mode to Alcatel. Select this mode when a CPOS interface needs to connect to an Alcatel device.	-
huawei	Sets the connection mode to Huawei. Select this mode when a CPOS interface needs to connect to a Huawei device.	-

 Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
lucent	Sets the connection mode to Lucent. Select this mode when a CPOS interface needs to connect to a Lucent device.	-

Views

CPOS interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

When CPOS interfaces of a Huawei device and a non-Huawei device are connected through optical fibers or using WDM, configure the connection mode for the CPOS interface.

A router provides three connection modes: Alcatel mode, Huawei mode, and Lucent mode. Configure the mode to suit the device connected to the CPOS interface.

NOTE

When the E1/T1 links on all low-end devices are aggregated to the device's CPOS interface through an SDH/SONET network, you do not need to configure the connection mode for the CPOS interface.

Precautions

After running the **multi-channel align-mode** command, you need to run the **reset slot** command or run both the **power off slot** and **power on slot** commands to restart the corresponding interface board for the configuration to take effect.

Example

Set the connection mode of a CPOS interface to Lucent.

```
<Huawei> system-view
[Huawei] controller cpos 1/0/0
[Huawei-Cpos1/0/0] multi-channel align-mode align-mode lucent
```

Related Topics

5.14.6 display cpos multi-channel

5.14.19 multiplex mode

Function

Using the **multiplex mode** command, you can set the AUG multiplexing mode.

Copyright © Huawei Technologies Co., Ltd.

Using the **undo multiplex mode** command, you can restore the default setting.

By default, **au-4** is used.

Format

multiplex mode { **au-4** | **au-3** }

undo multiplex mode

Parameters

Parameter	Description	Value
au-4	Indicates AUG multiplexes to AU-4.	-
au-3	Indicates AUG multiplexes to AU-3.	-

Views

CPOS interface view

Default Level

2: Configuration level

Usage Guidelines

Choose a proper AUG multiplexing mode and ensure that the AUG multiplexing mode of the CPOS interface is the same on both ends.

NOTE

When CPOS is applied in the SDH mode, using the **multiplex mode** command, you can configure AUG to multiplex to either AU-4 or AU-3.

When CPOS is applied in the SONET mode, AUG can multiplex only to AU-3. The **multiplex mode** command does not take effect.

Example

Configure AUG to multiplex to AU-3 in the SDH mode.

```
<Huawei> system-view
[Huawei] controller cpos 1/0/0
[Huawei-Cpos1/0/0] frame-format sdh
[Huawei-Cpos1/0/0] multiplex mode au-3
```

Related Topics

5.14.15 frame-format (CPOS interface view)

Copyright © Huawei Technologies Co., Ltd.

5.14.20 set workmode cpos

Function

The **set workmode cpos** command sets the working mode of a 1CPOS-155M/1CPOS-155M-WM interface card.

By default, a 1CPOS-155M/1CPOS-155M-W interface card works in E1 mode (e1-data).

Format

set workmode slot *slot-id* **cpos** { **e1-data** | **t1-data** }

Parameters

Parameter	Description	Value
slot *slot-id*	Specifies the slot ID of a 1CPOS-155M/1CPOS-155M-W interface card.	Run the **display device** command to view slot IDs and types of interface cards and find the slot ID of the CPOS interface card.
e1-data	Indicates a 1CPOS-155M/1CPOS-155M-W interface card works in E1 mode and functions as a channelized E1 data card (CE1).	-
t1-data	Indicates a 1CPOS-155M/1CPOS-155M-W interface card works in T1 mode and functions as a channelized T1 data card (CT1).	-

Views

System view

Default Level

3: Management level

Usage Guidelines

After this command is used, the system prompts you to reset the CPOS interface card to make the new working mode take effect. If you select **Yes**, the system resets the interface card. Otherwise, you need to run the **reset slot** command to manually reset the interface card to make the new working mode take effect.

Copyright © Huawei Technologies Co., Ltd.

Example

Set the 1CPOS-155M-W interface card in slot 2 to work in T1 mode.

```
<Huawei> system-view
[Huawei] set workmode slot 2 cpos t1-data
Warning: Changing the working mode will reset the board in slot 2. Continue? [y/
n]:y
INFO: Resetting board[2] succeeded.
```

Related Topics

4.1.3 display device

5.14.21 shutdown (CPOS interface view)

Function

The **shutdown** command shuts down the current CPOS physical interface.

The **undo shutdown** command enables a CPOS physical interface.

By default, a CPOS physical interface is enabled.

Format

shutdown

undo shutdown

Parameters

None

Views

CPOS interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

You can run the **shutdown** command to shut down an idle interface that is not connected to a cable.

Precautions

- After the **shutdown** command is run on a CPOS physical interface, all E1/T1 channels of the CPOS interface and interfaces that timeslots are bound into are shut down and stop receiving and sending data. Data may be lost if you disable an interface during data transmission. Exercise caution when you use the **shutdown** command.
- After the **undo shutdown** command is run on a COS interface, the CPOS physical interface and interfaces that timeslots are bound into go Up.

 Copyright © Huawei Technologies Co., Ltd.

Example

Disable the physical port CPOS 1/0/0.

```
<Huawei> system-view
[Huawei] controller cpos 1/0/0
[Huawei-Cpos1/0/0] shutdown
```

Related Topics

5.14.27 t1 shutdown (CPOS interface view)

5.14.22 t1 channel-set (CPOS interface view)

Function

The **t1 channel-set** command configures a T1 channel to work in channelized mode and bundles timeslots of T1 channel together.

The **undo t1 channel-set** command unbinds the timeslots.

By default, the device does not bundle timeslots of T1 channel.

Format

t1 *t1-number* **channel-set** *set-number* **timeslot-list** *slots-list* [**speed** { **56k** | **64k** }]

undo t1 *t1-number* **channel-set** *set-number*

Parameters

Parameter	Description	Value
t1-number	Specifies the T1 channel number of a CPOS interface.	The value ranges from 1 to 84 in integer.
set-number	Specifies the number of the channel set.	The value ranges from 0 to 23 in integer.
timeslot-list *slot-list*	Specifies the number or range of bound timeslots.	It is an integer in the range of 1 to 24. Time slots are separated by ","; while the range is expressed by "-".
speed { **56k** | **64k** }	Specifies the timeslot binding mode. • If **56k** is selected, binding mode is N x 56 kbit/s. • If **64k** is selected, binding mode is N x 64 kbit/s. If **speed** is not specified, the default 64 kbit/s is used.	-

Copyright © Huawei Technologies Co., Ltd.

Views

CPOS interface view

Default Level

2: Configuration level

Usage Guidelines

The T1 channel of a CPOS interface can work in unchannelized or channelized mode.

- In unchannelized mode, a T1 interface works at a rate of 1.544 Mbit/s without timeslot division. The logical features of a T1 channel are the same as those of a synchronous serial interface.
- When a T1 channel works in channelized mode, timeslots numbered 1 to 24 can be randomly bundled into a channel set that functions as an interface. The rate of the interface is N x 56 kbit/s or N x 64 kbit/s, in which N is the number of timeslots bundled into a channel set. The interface has the same logical features as a synchronous serial interface.

In channelized mode, the name and number of a T1 channel is **serial** *interface-number*/*t1-number*.*set-number*. *interface-number* specifies the number of the CPOS interface, *t1-number* specifies the T1 channel number, and *set-number* specifies the number of the channel set.

Example

Configure T1 channel 1 to work in channelized mode and bundle timeslots of T1 channel 1.

```
<Huawei> system-view
[Huawei] controller cpos 1/0/0
[Huawei-Cpos1/0/0] t1 1 channel-set 1 timeslot-list 1-24
```

Enter the view of the serial interface generated after binding.

```
[Huawei-Cpos1/0/0] quit
[Huawei] interface serial 1/0/0/1:1
[Huawei-Serial1/0/0/1:1]
```

Related Topics

5.14.28 t1 unframed (CPOS interface view)

5.14.23 t1 set clock (CPOS interface view)

Function

The **t1 set clock** command sets the clock mode of a T1 channel.

The **undo t1 set clock** command restores the default setting.

By default, the clock mode of a T1 channel is slave.

 Copyright © Huawei Technologies Co., Ltd.

Format

t1 *t1-number* **set clock** { **master** | **slave** }

undo t1 *t1-number* **set clock**

Parameters

Parameter	Description	Value
t1-number	Specifies the T1 channel number of a CPOS interface.	The value ranges from 1 to 84 in integer.
master	Sets the clock mode of a T1 channel to master.	-
slave	Sets the clock mode of a T1 channel to slave.	-

Views

CPOS interface view

Default Level

2: Configuration level

Usage Guidelines

The clock modes of the different T1 channels of the same CPOS interface are independent from each other. The clock mode of the T1 channel must be different on both ends.

Example

Configure T1 channel 1 to use the master clock mode.

```
<Huawei> system-view
[Huawei] controller cpos 1/0/0
[Huawei-Cpos1/0/0] t1 1 set clock master
```

Related Topics

5.14.5 display controller cpos t1

5.14.24 t1 set flag (CPOS interface view)

Function

The **t1 set flag** command sets the overhead byte of a T1 channel.

The **undo t1 set flag** command restores the default setting.

By default, J2 repeatedly transmits a string of null characters, and the V5 byte value is 2.

Copyright © Huawei Technologies Co., Ltd.

Format

t1 *t1-number* **set flag** { **j2** { **1byte-mode** *1byte-string* | **16byte-mode** *16byte-string* } | **v5** *v5-string* }

undo t1 *t1-number* **set flag** { **j2** | **v5** }

Parameters

Parameter	Description	Value
t1-number	Specifies the T1 channel number of a CPOS interface.	The value is an integer that ranges from 1 to 84.
j2 1byte-mode *1byte-string*	Sets the 1-byte length trace format for the low-order path trace byte J2.	The value is a string of 1 character.
j2 16byte-mode *16byte-string*	Sets the 16-byte length trace format for the low-order path trace byte J2.	The value is a string of 1 to 15 characters.
v5 *v5-string*	Sets the low-order path signal label byte V5.	The value is an integer that ranges from 2 to 4.

Views

CPOS interface view

Default Level

2: Configuration level

Usage Guidelines

The pathoverhead (POH) of T1 channels must be the same on both ends; otherwise, devices on both ends may not communicate properly.

Example

Set the V5 byte of T1 channel 1 on a CPOS interface to 4.

```
<Huawei> system-view
[Huawei] controller cpos 1/0/0
[Huawei-Cpos1/0/0] t1 1 set flag v5 4
```

Related Topics

5.14.5 display controller cpos t1

5.14.25 t1 set frame-format (CPOS interface view)

Function

The **t1 set frame-format** command configures the frame format of a T1 channel.

Copyright © Huawei Technologies Co., Ltd.

The **undo t1 set frame-format** command restores the default setting.

By default, the frame format of a T1 channel is ESF.

Format

t1 *t1-number* **set frame-format** { **esf** | **sf** }

undo t1 *t1-number* **set frame-format**

Parameters

Parameter	Description	Value
t1-number	Specifies the T1 channel number of a CPOS interface.	The value ranges from 1 to 84 in integer.
esf	Sets the frame format of the T1 channel to extended super frame (ESF).	-
sf	Sets the frame format of the T1 channel to super frame (SF).	-

Views

CPOS interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The T1 channel channelized by CPOS interfaces supports the SF format and ESF format. The two formats enable multiple frames to share the frame alignment information and signaling information so that more bits can be used to transmit data.

- SF: consists of 12 frames that share the frame alignment information and signaling information. Frame 6 and frame 12 are signaling frames.
- ESF: consists of 24 frames that share the frame alignment information and signaling information. Frames 6, 12, 18, and 24 are signaling frames.

Precautions

The frame format of the T1 channel must be the same on both ends.

NOTE

If the **t1 unframed** command has been used, run the **undo t1 unframed** command to disable the T1 channel from working in unframed mode before running the **t1 set frame-format** command to configure the frame format for the T1 channel.

 Copyright © Huawei Technologies Co., Ltd.

Example

Set the frame format of T1 channel 1 to SF.

```
<Huawei> system-view
[Huawei] controller cpos 1/0/0
[Huawei-Cpos1/0/0] t1 1 set frame-format sf
```

Related Topics

5.14.5 display controller cpos t1

5.14.26 t1 set loopback (CPOS interface view)

Function

The **t1 set loopback** command enables loopback detection of a T1 channel and sets the detection mode.

The **undo t1 set loopback** command disables the loopback detection of a T1 channel.

By default, the loopback detection of a T1 channel is disabled.

Format

t1 *t1-number* **set loopback** { **local** | **remote** }

undo t1 *t1-number* **set loopback**

Parameters

Parameter	Description	Value
t1-number	Specifies the T1 channel number of a CPOS interface.	The value ranges from 1 to 84 in integer.
local	Sets a T1 channel to implement local loopback.	-
remote	Sets a T1 channel to implement remote loopback.	-

Views

CPOS interface view

Default Level

2: Configuration level

Usage Guidelines

The loopback is generally used to perform some special tests. In the normal situation, the loopback should be disabled.

Copyright © Huawei Technologies Co., Ltd.

- In the internal loopback, data at the sending end is looped back to the receiving end.
- In the external remote loopback, the received data is looped back without passing through the E1 framer and generating the payload.

When a loopback is enabled on an T1 channel, the loopback is valid for the synchronous serial interface formed by the T1 channel.

- When the link layer protocol of the synchronous serial interface is PPP, the physical status of the synchronous serial interface is Up; whereas the link layer protocol is Down.
- When the link layer protocol used by the synchronous serial interface is HDLC, the physical status and link layer status at both ends depend on the loopback mode:
  - In the internal loopback, the physical status of interfaces at both ends is Up. The link layer status of the sending end is Up, and that of the receiving end is Down.
  - In the external remote loopback, the physical status of interfaces at both ends is Up. The link layer status of the sending end is Down, and that of the receiving end is Up.

Example

Configure the T1 channel 1 to perform the remote loopback.

```
<Huawei> system-view
[Huawei] controller cpos 1/0/0
[Huawei-Cpos1/0/0] t1 1 set loopback remote
```

Related Topics

5.14.5 display controller cpos t1

5.14.27 t1 shutdown (CPOS interface view)

Function

The **t1 shutdown** command disables a T1 channel.

The **undo t1 shutdown** command enables a T1 channel.

By default, a T1 channel is enabled.

Format

t1 *t1-number* **shutdown**

undo t1 *t1-number* **shutdown**

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
t1-number	Specifies the T1 channel number of a CPOS interface.	The value ranges from 1 to 84 in integer.

Views

CPOS interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

You can run the **t1 shutdown** command to disable an idle T1 channel.

Precautions

- After the **t1 shutdown** command is run on a T1 channel, the T1 channel and interfaces that timeslots are bound into are shut down and stop receiving and sending data. Data may be lost if you disable the T1 channel during data transmission. Exercise caution when you use the **shutdown** command.
- After the **undo shutdown** command is run on a T1 channel, the T1 channel and interfaces that timeslots are bound into go Up.

Example

Disable the T1 channel 1.

```
<Huawei> system-view
[Huawei] controller cpos 1/0/0
[Huawei-Cpos1/0/0] t1 1 shutdown
```

Related Topics

5.14.21 shutdown (CPOS interface view)

5.14.28 t1 unframed (CPOS interface view)

Function

The **t1 unframed** command configures a T1 channel to work in unchannelized mode and generates an interface working at a rate of 1.544 Mbit/s without timeslot division.

The **undo t1 unframed** command restores the default configuration.

By default, a T1 channel works in channelized mode.

Copyright © Huawei Technologies Co., Ltd.

Format

t1 *t1-number* **unframed**

undo t1 *t1-number* **unframed**

Parameters

Parameter	Description	Value
t1-number	Specifies the T1 channel number of a CPOS interface.	The value ranges from 1 to 84 in integer.

Views

CPOS interface view

Default Level

2: Configuration level

Usage Guidelines

The T1 channel of a CPOS interface can work in unchannelized or channelized mode.

- In unchannelized mode, a T1 interface works at a rate of 1.544 Mbit/s without timeslot division. The logical features of a T1 channel are the same as those of a synchronous serial interface.
- When a T1 channel works in channelized mode, timeslots numbered 1 to 24 can be randomly bundled into a channel set that functions as an interface. The rate of the interface is N x 56 kbit/s or N x 64 kbit/s. The interface has the same logical features as a synchronous serial interface.

In channelized mode, the name and number of interfaces formed by the T1 channel are **serial** *interface-number*|*t1-number*.**0**. *interface-number* specifies the number of the CPOS interface, and *t1-number* specifies the T1 channel number.

Example

Configure the T1 channel 3 of the CPOS 1/0/0 to work in the unframed mode.

```
<Huawei> system-view
[Huawei] controller cpos 1/0/0
[Huawei-Cpos1/0/0] t1 3 unframed
```

Display the T1 channel 3 interface view.

```
[Huawei] interface serial 1/0/0/3:0
[Huawei-Serial1/0/0/3:0]
```

Related Topics

5.14.5 display controller cpos t1

Copyright © Huawei Technologies Co., Ltd.

5.14.29 threshold (CPOS interface view)

Function

The **threshold** command sets alarm thresholds for a CPOS interface.

The **undo threshold** command restores the default alarm thresholds.

The default SD (signal degrade) alarm threshold is 10e-6 and the default SF alarm threshold is 10e-3.

Format

threshold { **sd** | **sf** } *value*

undo threshold { **sd** | **sf** }

Parameters

Parameter	Description	Value
sd *value*	Specifies the SD alarm threshold.	The value is an integer that ranges from 3 to 9. The alarm threshold is 10e-*value*.
sf *value*	Specifies the SF (signal failure) alarm threshold.	The value is an integer that ranges from 3 to 9. The alarm threshold is 10e-*value*.

Views

CPOS interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

When link performance deteriorates, set the alarm thresholds on CPOS interfaces to learn link status.

- When link performance deteriorates a little, an SD alarm is reported.
- When link performance deteriorates greatly, an SF alarm is reported.

Precautions

The SD alarm threshold must be smaller than the SF alarm threshold.

Example

Set the SD alarm threshold of CPOS 1/0/0 to 10e-8.

```
<Huawei> system-view
[Huawei] controller cpos 1/0/0
[Huawei-Cpos1/0/0] threshold sd 8
```

 Copyright © Huawei Technologies Co., Ltd.

Related Topics

5.14.27 t1 shutdown (CPOS interface view)

5.15 ADSL Interface Configuration Commands

NOTE

Among the AR150&AR160&AR200 series, only the AR156, AR156W, AR157 series, AR206, and AR207 series support ADSL interfaces.

Among the AR150&AR160&AR200, only the AR157, AR157W, AR157VW, AR157G-HSPA+7, AR207, AR207V, AR207VW, AR207V-P, and AR207G-HSPA+7 support AnnexM. Among the AR150&AR160&AR200, only the AR156, AR156W, and AR206 support AnnexJ.

AR1200, AR2200 (except AR2201-48FE and AR2202-48FE), AR3200, and AR3600 series provide ADSL-A/M and ADSL-B/J boards. Only the ADSL-A/M boards support AnnexM. Only the ADSL-B/J boards support AnnexJ.

5.15.1 adsl bitswap (adsl)

Function

The **adsl bitswap** command enables or disables bit exchange on an ADSL interface.

By default, bit exchange is enabled on an ADSL interface.

Format

adsl bitswap { **off** | **on** }

Parameters

Parameter	Description	Value
off	Disables bit exchange on an ADSL interface.	-
on	Enables bit exchange on an ADSL interface.	-

Views

ADSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Copyright © Huawei Technologies Co., Ltd.

During line activation, every sub-channel calculates the signal-to-noise ratio (SNR) and the number of bits to be transmitted. After the line is activated, the SNR may change because the external environment changes. For example, the SNRs of some sub-channels reduce, whereas the SNRs of some other sub-channels increase. After a long period of time, the line may be disconnected.

The bit exchange function has the following advantages:

- Allows sub-channels failing to transmit the specified number of bits to switch some bits to sub-channels with higher SNRs.
- Reduces the transmit power of sub-channels with higher SNRs to increase the sending rate and SNRs of sub-channels with lower SNRs.

  This reduces the bit error rate without triggering line negotiation.

Prerequisites

The ADSL interface has been deactivated by using the **shutdown** command.

Follow-up Procedure

To make bit exchange take effect immediately on an ADSL interface, run the **undo shutdown** command to activate the ADSL interface.

Precautions

Bit exchange must be enabled on devices on both ends of a line and takes effect only after the line is activated.

Example

Disable bit exchange on ADSL interface 1/0/0.

```
<Huawei> system-view
[Huawei] interface atm 1/0/0
[Huawei-Atm1/0/0] shutdown
[Huawei-Atm1/0/0] adsl bitswap off
[Huawei-Atm1/0/0] undo shutdown
```

Related Topics

5.15.8 interface atm (adsl)

5.15.11 shutdown (adsl)

5.15.2 adsl sra (adsl)

Function

The **adsl sra** command enables or disables seamless rate adaptation on an ADSL interface.

By default, seamless rate adaptation is disabled on an ADSL interface.

Format

adsl sra { **off** | **on** }

 Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
off	Disables seamless rate adaptation on an ADSL interface.	-
on	Enables seamless rate adaptation on an ADSL interface.	-

Views

ADSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

When the external environment changes, to prevent the line disconnection, use the bit exchange function to adjust bit distribution or the power among sub-channels without deactivating the line. The bit exchange function, however, cannot change the line rate. When the line environment becomes worse, the bit exchange function cannot meet the requirement for the bit error rate. The bit exchange function just allows the line to be activated at a smaller rate. When the line environment becomes better, the bit exchange function cannot adjust the rate, wasting line resources.

Seamless rate adaptation solves the preceding problem. It dynamically adjusts the line rate without reactivating the line.

Prerequisites

The ADSL interface has been deactivated by using the **shutdown** command.

Follow-up Procedure

To make seamless rate adaptation take effect immediately on an ADSL interface, run the **undo shutdown** command to activate the ADSL interface.

Precautions

Seamless rate adaptation must be enabled on devices on both ends of a line and takes effect only after the line is activated.

Example

Enable seamless rate adaptation on ADSL interface 1/0/0.

```
<Huawei> system-view
[Huawei] interface atm 1/0/0
[Huawei-Atm1/0/0] shutdown
[Huawei-Atm1/0/0] adsl sra on
[Huawei-Atm1/0/0] undo shutdown
```

 Copyright © Huawei Technologies Co., Ltd.

Related Topics

5.15.8 interface atm (adsl)

5.15.11 shutdown (adsl)

5.15.3 adsl standard (adsl)

Function

The **adsl standard** command configures a transmission standard for an ADSL interface.

The **undo adsl standard** command restores the default setting.

By default, an ADSL interface transmission standard is **auto**.

Format

adsl standard { **adsl2** [**annexm** | **annexj** | **annexl**] | **adsl2+** [**annexm** | **annexj**] | **auto** | **gdmt** | **t1413** }

undo adsl standard

Parameters

Parameter	Description	Value
adsl2	Configures ADSL2 (G.992.3) for an ADSL interface. ADSL2 provides fast transmission rates by improving the modulation rate, coding gain, and initialization state machine, reducing the frame overhead, and using enhanced signal processing methods. ADSL2 can provide a maximum of 1 Mbit/s upstream transmission rate and 12 Mbit/s downstream transmission rate.	-
adsl2+	Configures ADSL2+ (G.992.5) for an ADSL interface. ADSL2+ expands the frequency band to 2.208 MHz and provides a maximum of 1 Mbit/s upstream transmission rate and 24 Mbit/s downstream transmission rate.	-
annexm	Supports the expansion of upstream frequency band of ADSL2 or ADSL2+ and provides a maximum of 2 Mbit/s upstream transmission rate. **NOTE** ADSL boards on the device include ADSL-A/M and ADSL-B/J boards. Only ADSL-A/M boards support this parameter.	-

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
annexj	Supports the expansion of upstream frequency band of ADSL2 or ADSL2+ and provides a maximum of 3.078 Mbit/s upstream transmission rate. **NOTE** ADSL boards on the device include ADSL-A/M and ADSL-B/J boards. Only ADSL-B/J boards support this parameter.	-
annexl	Configures reach extended ADSL2 (AnnexL for short) for an ADSL interface. AnnexL is defined in ADSL2 recommendation. It uses a narrower frequency band and optimizes the power spectral density (PSD) mask to provide long-distance transmission of high performance. **NOTE** ADSL boards on the device include ADSL-A/M and ADSL-B/J boards. Only ADSL-A/M boards support this parameter.	-
auto	Configures an ADSL interface to automatically adapt to the transmission standard of the remote ADSL interface. If this parameter is specified, the device selects the same transmission standard as a DSLAM from G.DMT, ADSL2, AnnexL, ADSL2+, AnnexM, and T1.413.	-
gdmt	Configures G.DMT (G.992.1) for an ADSL interface. G.DMT provides an upstream frequency band from 25 kHz to 138 kHz, a downstream frequency band from 138 kHz to 1.104 MHz, a maximum of 1 Mbit/s upstream transmission rate, and a maximum of 8 Mbit/s downstream transmission rate.	-
t1413	Configures T1.413 for an ADSL interface. When an ADSL interface uses T1.413, the ADSL interface works in full rate mode, and provides a maximum of 1 Mbit/s upstream transmission rate and 8 Mbit/s downstream transmission rate. **NOTE** ADSL boards on the device include ADSL-A/M and ADSL-B/J boards. Only ADSL-A/M boards support this parameter.	-

Copyright © Huawei Technologies Co., Ltd.

Views

ADSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

To enable the device to transmit services on an ADSL line, run the **adsl standard** command to configure the device to use the same transmission standard as a DSLAM. You are advised to configure the device to automatically adapt to the transmission standard of the DSLAM.

Prerequisites

The ADSL interface has been deactivated by using the **shutdown** command.

Follow-up Procedure

To make the transmission standard configured for an ADSL interface take effect, run the **undo shutdown** command on the interface to activate the interface.

Example

Configure T1.413 for ADSL interface 1/0/0.

```
<Huawei> system-view
[Huawei] interface atm 1/0/0
[Huawei-Atm1/0/0] shutdown
[Huawei-Atm1/0/0] adsl standard t1413
[Huawei-Atm1/0/0] undo shutdown
```

Related Topics

5.15.8 interface atm (adsl)

5.15.11 shutdown (adsl)

5.15.4 adsl trellis (adsl)

Function

The **adsl trellis** command enables or disables trellis coding on an ADSL interface.

By default, trellis coding is enabled on an ADSL interface.

Format

adsl trellis { **off** | **on** }

 Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
off	Disables trellis coding on an ADSL interface.	-
on	Enables trellis coding on an ADSL interface.	-

Views

ADSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Trellis coding increases the signal noise ratio (SNR) by using a coding algorithm with a high coding efficiency. After trellis coding is enabled, the line activation rate is greatly increased.

Prerequisites

The ADSL interface has been deactivated by using the **shutdown** command.

Follow-up Procedure

To make trellis coding take effect immediately on an ADSL interface, run the **undo shutdown** command to activate the ADSL interface.

Precautions

Trellis coding must be enabled on devices on both ends of a line and takes effect only after the line is activated.

As specified in ADSL2 (G.992.3) and ADSL2+ (G.992.5) standards, trellis coding must be enabled. Under normal circumstances, it is recommended that you do not disable trellis coding; otherwise, interface connection problems may occur.

Example

Disable trellis coding on ADSL interface 1/0/0.

```
<Huawei> system-view
[Huawei] interface atm 1/0/0
[Huawei-Atm1/0/0] shutdown
[Huawei-Atm1/0/0] adsl trellis off
[Huawei-Atm1/0/0] undo shutdown
```

Related Topics

5.15.8 interface atm (adsl)

Copyright © Huawei Technologies Co., Ltd.

5.15.11 shutdown (adsl)

5.15.5 display dsl all interface

Function

The **display dsl all interface** command displays status information about all xDSL interfaces.

Format

display dsl all interface

Parameters

None

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

Usage Scenario

You can run the **display dsl all interface** command to check the negotiation status with xDSL interfaces at the central office, transmission standard, line status, performance statistics, bit exchange status, seamless rate adaptation status, trellis coding status, and card version of the ADSL interface and VDSL interface (in ATM or PTM mode), and check the link status, vendor, and performance statistics of the G.SHDSL interface.

Precautions

This command cannot display information about xDSL sub-interfaces.

Example

Display status information about all xDSL interfaces.

```
<Huawei> display dsl all interface
 Atm1/0/0 information:
 ------------------------------------------------------------------
 DSL driver and PHY status
     Line0:
     Training status                  : Showtime
     Transmission mode                    : VDSL2
     VDSL2 profile                    : Profile 17a
     Line status                      : No Defect
     Downstream max. attainable rate(Kbps): 142372
     Upstream max. attainable rate(Kbps)  : 63853
     Downstream actual net data rate(Kbps): 60016
     Upstream actual net data rate(Kbps)  : 20013
     Downstream SNR margin(dB)            : 28.8
```

 Copyright © Huawei Technologies Co., Ltd.

```
    Upstream SNR margin(dB)              : 31.9
    Downstream attenuation(dB)           : 0.0
    Upstream attenuation(dB)             : 0.0
    Downstream output power(dBm)         : 14.5
    Upstream output power(dBm)           : -6.4
    Downstream total cells               : 1348781845
    Upstream total cells                 : 0
    Downstream data cells                : 0
    Upstream data cells                  : 0
    Downstream bit errors                : 0
    Upstream bit errors                  : 0
    Total drop cells                     : 0
    Downstream total ES count            : 60
    Upstream total ES count              : 0
    Downstream total SES count           : 59
    Upstream total SES count             : 0
    Downstream total UAS count           : 849
    Upstream total UAS count             : 849
    Total AS count                       : 86128

    Line1:
    Training status                      : Showtime
    Transmission mode                    : VDSL2
    VDSL2 profile                        : Profile 17a
    Line status                          : No Defect
    Downstream max. attainable rate(Kbps): 145984
    Upstream max. attainable rate(Kbps)  : 64009
    Downstream actual net data rate(Kbps): 60016
    Upstream actual net data rate(Kbps)  : 20013
    Downstream SNR margin(dB)            : 28.0
    Upstream SNR margin(dB)              : 32.4
    Downstream attenuation(dB)           : 0.0
    Upstream attenuation(dB)             : 0.0
    Downstream output power(dBm)         : 13.1
    Upstream output power(dBm)           : -6.5
    Downstream total cells               : 1360438742
    Upstream total cells                 : 0
    Downstream data cells                : 0
    Upstream data cells                  : 0
    Downstream bit errors                : 0
    Upstream bit errors                  : 0
    Total drop cells                     : 0
    Downstream total ES count            : 59
    Upstream total ES count              : 0
    Downstream total SES count           : 56
    Upstream total SES count             : 0
    Downstream total UAS count           : 683
    Upstream total UAS count             : 683
    Total AS count                       : 86230

Line capability
    Bitswap                              : On
    SRA                                  : Off
    Trellis coding                       : On

Board version
    vendor ID                            : 0xB5 0 "BDCM" 0 0
    vendor serial                        : 10000000000000000000000000000000
    Board ID                             : 963168MBV_17A
    Software version                     : 4.12L.08
    Bootloader (CFE) version             : 1.0.38-112.118
    DSL PHY and driver version           : A2pvbF038j.d24h
    Build timestamp                      : 20170706_1814

ATU-C version
    vendor ID                            : BDCM:0x938f
    vendor number                        : 0x938f
----------------------------------------------------------------
```

```
Atm2/0/1 information:
------------------------------------------------------------------
 Operating mode                      :CPE
 Port admin status                   :Active
 Port running status                 :Activated
 Port admin bind status              :EFM-2
 Bind group master port              :0
 Bind group running port             :1;
 LOSWS Defect alarm                  :none
 SNR Margin alarm                    :none
 Loop Attenuation alarm              :none
 Modem status                        :DOWN_READY
 Condition                           :NO_COND_
 Reason                              :ERR_UNUSED_
 Port transmission mode              :G.991.2 Annex A&B&F&G
 Port power spectral density         :Symmetric
 Port line probe                     :Enable
 Inventory of SHDSL port 0
 Vendor ID                           :Infineon
 Vendor mode                         :SOCRATES
 Vendor serial                       :4e_2e_1e
 EOC version                         :0
 Standard version                    :8
 Vendor list                         :-
 Vendor issue                        :1
 Software code                       :1.7.2
 Equipment code                      :-
 Information of other vendor         :V200R008
 Transmission mode capability        :G.991.2 Annex A&B&F&G
------------------------------------------------------------------
```

Table 5-49 Description of the **display dsl all interface** command output

Item	Description
Atm1/0/0 information	Information about ATM1/0/0. ATM1/0/0 in this example is a VDSL interface. For detailed command output descriptions, see **display dsl interface atm (vdsl)** and **display dsl interface ethernet (vdsl)**. For detailed command output description of an ADSL interface, see **display dsl interface atm (adsl)**.
Atm2/0/1 information	Information about ATM2/0/1. ATM2/0/1 in this example is a G.SHDSL interface. For detailed command output description, see **display dsl interface (g.shdsl)**.

5.15.6 display interface atm (adsl)

Function

The **display interface atm** command displays the configuration and status of an ADSL interface.

Format

display interface atm [*interface-number*]

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
interface-number	Specifies the ADSL interface number.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

When monitoring the interface status or locating faults on an ADSL interface, run the **display interface atm** command on the interface. You can collect traffic statistics and locate faults on the interface according to the command output.

Example

Display the configuration and status of ADSL interface 1/0/0.

```
<Huawei> display interface atm 1/0/0
Atm1/0/0 current state : DOWN
Line protocol current state : DOWN
Description:HUAWEI, AR Series, Atm1/0/0 Interface
Route Port,The Maximum Transmit Unit is 1488
Internet Address is 1.1.1.1/24
AAL enabled: AAL5, Maximum PVCs: 16
PVCs on main-interface: 2 (Total PVCs: 6)
Last physical up time   : 2012-12-31 17:46:03
Last physical down time : 2013-01-04 16:56:30
Current system time: 2013-01-06 14:06:16

Port PHY type    : ADSL
CRC anomaly count: 0
The physical up times since the board startup  : 1
Last 300 seconds input rate 0 bits/sec, 0 packets/sec
Last 300 seconds output rate 0 bits/sec, 0 packets/sec

Input correct packet:  264237922 packets, Input total data:  38232948935 bytes
  OAM Cells:           2398245,  ASM Cells:                0
  Packet Errors:             1,  Packet Discards:          1
  Cell Errors:             888

Output:  261837042 packets, 38967726112 bytes
  OAM Cells:           2398272,  ASM Cells:                0
  Packet Errors:             0,  Packet Discards:          0
    Input bandwidth utilization  :    0%
    Output bandwidth utilization :    0%
```

 Copyright © Huawei Technologies Co., Ltd.

Table 5-50 Description of the display interface atm command output

Item	Description
Atm1/0/0 current state	Physical status of ATM1/0/0: • UP: indicates that the interface is physically Up. • DOWN: indicates that the interface is physically Down. • Administratively down: indicates that the network administrator has run the **shutdown** command on the interface.
Line protocol current state	Link layer protocol status of the interface: • UP: indicates that the link layer protocol status of the interface is Up. • DOWN: indicates that the link layer protocol status of the interface is Down or no IP address is assigned to the interface.
Description	Interface description. The description contains a maximum of 242 case-sensitive characters, with spaces supported. This field describes functions of the ADSL interface.
The Maximum Transmit Unit is	Maximum transmit unit (MTU) of the interface. By default, the MTU is 1488 bytes. Packets whose size is greater than the MTU are fragmented before being transmitted. If non-fragmentation is configured, these packets are discarded.
Internet Address is	IP address of the interface. If no IP address is assigned to the interface, the system displays "Internet protocol processing : disabled".
AAL enabled	ATM Adaptation Layer (AAL). **NOTE** The device supports only AAL5.
Maximum PVCs	Maximum number of permanent virtual circuits (PVCs).
PVCs on main-interface: (Total PVCs:)	Number of PVCs on the main interface (total number of PVCs on both the main interface and sub-interfaces).
Last physical up time	Last time the interface went Up physically. If the value of this field is displayed as "-", the physical status of the interface does not change. If the time zone is configured and the daylight saving time is used, the time is in YYYY-MM-DD HH:MM:SS UTC±HH:MM DST format.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Last physical down time	Last time the interface went Down physically. If the value of this field is displayed as "-", the physical status of the interface does not change. If the time zone is configured and the daylight saving time is used, the time is in YYYY-MM-DD HH:MM:SS UTC±HH:MM DST format.
Current system time	Current system time. If the time zone is configured and the daylight saving time is used, the time is in YYYY-MM-DD HH:MM:SS UTC±HH:MM DST format.
Port PHY type	Physical type of the interface.
CRC anomaly count	Number of abnormal CRC packets.
The physical uptimes since the system startup	Number of times that interface becomes Up after the system starts.
OAM Cells	Number of OAM cells.
ASM Cells	Number of incoming autonomous status message (ASM) cells.
Packet Errors	Number of error packets.
Packet Discards	Number of discard packets.
Cell Errors	Number of error cells.
Input bandwidth utilization	Percentage of the incoming packet rate to the total bandwidth.
Output bandwidth utilization	Percentage of the outgoing packet rate to the total bandwidth.

Related Topics

5.15.8 interface atm (adsl)

5.15.7 display dsl interface atm (adsl)

Function

The **display dsl interface atm** command displays information about an ADSL interface.

Format

display dsl interface atm *interface-number*

 Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
interface-number	Specifies the ADSL interface number.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

According to the **display dsl interface atm** command output, you can check the training status, transmission standard, line status, performance statistics, bit exchange status, seamless rate adaptation status, trellis coding status, and board version of the ADSL interface.

Example

Display information about ADSL interface 1/0/0.

```
<Huawei> display dsl interface atm 1/0/0
 ------------------------------------------------------------
 DSL driver and PHY status
     Training Status                  : Showtime
     Transmission mode                : ADSL2+
     Line Status                      : No Defect
     Downstream max. attainable rate(Kbps): 28184
     Upstream max. attainable rate(Kbps)  : 2529
     Downstream actual net data rate(Kbps): 24538
     Upstream actual net data rate(Kbps)  : 1021
     Downstream SNR margin(dB)        : 13.1
     Upstream SNR margin(dB)          : 18.9
     Downstream attenuation(dB)       : 0.0
     Upstream attenuation(dB)         : 4.8
     Downstream output power(dB)      : 7.2
     Upstream output power(dB)        : -8.3
     Downstream total cells           : 3305378
     Upstream total cells             : 74443
     Downstream data cells            : 36545
     Upstream data cells              : 5447
     Downstream bit errors            : 124
     Upstream bit errors              : 365
     Total drop cells                 : 241
     Downstream total ES count        : 0
     Upstream total ES count          : 0
     Downstream total SES count       : 0
     Upstream total SES count         : 0
     Downstream total UAS count       : 72
     Upstream total UAS count         : 72
     Total AS count                   : 36

 Line modulations
     G.Dmt                        : Disabled
     T1.413                       : Disabled
```

 Copyright © Huawei Technologies Co., Ltd.

```
    ADSL2                       : Disabled
    AnnexL                      : Disabled
    ADSL2+                      : Enabled
    AnnexM                      : Disabled

Line capability
    Bitswap                     : On
    SRA                         : Off
    Trellis coding              : On

Board version
    vendor ID                   : BDCM:0x938f
    vendor serial               : 0x938f
    Board ID:                   : 963281TAN
    Software version            : 4.06L.03
    Bootloader (CFE) version    : 1.0.37-106.24
    DSL PHY and driver version  : A2pD033a.d23c
    Build timestamp             : 20110221_2122

ATU-C version
    vendor ID                   : BDCM:0x938f
    vendor number               : 0x938f
-------------------------------------------------------------
```

Table 5-51 Description of the display dsl interface atm 1/0/0 command output

Item	Sub-item	Description
DSL driver and PHY status	Training Status	Training status of the ADSL interface: • Idle: indicates that the ADSL interface is idle. • Training: indicates that the ADSL interface is negotiating with the remote ADSL interface. • Showtime: indicates that negotiation between the two ADSL interfaces succeeds. **NOTE** Other sub-items of **DSL driver and PHY status** can be displayed only after negotiation between the local and remote ADSL interfaces succeeds.

 Copyright © Huawei Technologies Co., Ltd.

Item	Sub-item	Description
	Transmission mode	Transmission standard of the ADSL interface: • ADSL2: provides a maximum of 1 Mbit/s upstream transmission rate and 12 Mbit/s downstream transmission rate. • ADSL2 AnnexM: expands the upstream frequency band of ADSL2 and provides a maximum of 2 Mbit/s upstream transmission rate. • RE-ADSL2: is defined in ADSL2 recommendation. It uses a narrower frequency band and optimizes the power spectral density (PSD) mask to provide long-distance transmission of high performance. • ADSL2+: provides a maximum of 1 Mbit/s upstream transmission rate and 24 Mbit/s downstream transmission rate. • ADSL2+ AnnexM: expands the upstream frequency band of ADSL2+ and provides a maximum of 2 Mbit/s upstream transmission rate. • G.DMT: provides a maximum of 1 Mbit/s upstream transmission rate and 8 Mbit/s downstream transmission rate. • T1.413: provides a maximum of 1 Mbit/s upstream transmission rate and 8 Mbit/s downstream transmission rate. To configure the transmission standard, run the **adsl standard (adsl)** command.
	Line Status	Line status of the ADSL interface: • No Defect: indicates that the ADSL interface has been activated. • Loss of Frame: indicates that frames are lost. • Loss of Signal: indicates that signals are lost. • Loss of Power: indicates that the device is powered off. • Loss of Signal Quality: indicates that the signal quality is low.

 Copyright © Huawei Technologies Co., Ltd.

Item	Sub-item	Description
	Downstream max. attainable rate(Kbps)	Maximum downstream transmission rate (in kbit/s).
	Upstream max. attainable rate(Kbps)	Maximum upstream transmission rate (in kbit/s).
	Downstream actual net data rate(Kbps)	Actual downstream transmission rate (in kbit/s).
	Upstream actual net data rate(Kbps)	Actual upstream transmission rate (in kbit/s).
	Downstream SNR margin(dB)	Downstream noise margin (dB).
	Upstream SNR margin(dB)	Upstream noise margin (dB).
	Downstream attenuation(dB)	Downstream attenuation (dB).
	Upstream attenuation(dB)	Upstream attenuation (dB).
	Downstream output power(dB)	Downstream output power (dB).
	Upstream output power(dB)	Upstream output power (dB).
	Downstream total cells	Total number of downstream cells.
	Upstream total cells	Total number of upstream cells.
	Downstream data cells	Number of downstream data cells.
	Upstream data cells	Number of upstream data cells.
	Downstream bit errors	Downstream bit errors.
	Upstream bit errors	Upstream bit errors.
	Total drop cells	Total number of dropped cells.
	Downstream total ES count	Total number of downstream errored seconds.

Copyright © Huawei Technologies Co., Ltd.

Item	Sub-item	Description
	Upstream total ES count	Total number of upstream errored seconds.
	Downstream total SES count	Total number of downstream severely errored seconds.
	Upstream total SES count	Total number of upstream severely errored seconds.
	Downstream total UAS count	Total number of downstream unavailable seconds.
	Upstream total UAS count	Total number of upstream unavailable seconds.
	Total AS count	Total number of available seconds.
Line modulations	G.Dmt	Status of the transmission standards supported by the ADSL interface: • If the device is configured to automatically adapt to the transmission standard of the DSLAM, G.Dmt, T1.413, ADSL2, AnnexL, ADSL2+, and AnnexM are enabled. The device then selects the same transmission standard as the DSLAM from the preceding transmission standards. You can know which transmission standard is selected by viewing the **Transmission mode** field. • If a transmission standard is specified for the ADSL interface, only this transmission standard is enabled.
	T1.413	
	ADSL2	
	AnnexL	
	ADSL2+	
	AnnexM	
Line capability	Bitswap	Bit exchange status: • On: enabled • Off: disabled To configure bit exchange, run the **adsl bitswap (adsl)** command.
	SRA	Seamless rate adaptation status: • On: enabled • Off: disabled To configure seamless rate adaptation, run the **adsl sra (adsl)** command.

 Copyright © Huawei Technologies Co., Ltd.

Item	Sub-item	Description
	Trellis coding	Trellis coding status: • On: enabled • Off: disabled To configure trellis coding, run the **adsl trellis (adsl)** command.
Board version	vendor ID	ID of the peer-side chip vendor.
	vendor serial	Sequence number of the peer-side chip vendor.
	Board ID	Board ID.
	Software version	System software version.
	Bootloader (CFE) version	BootRom version.
	DSL PHY and driver version	Board driver version.
	Build timestamp	Time the board is registered.
ATU-C version	vendor ID	ID of the peer-side chip vendor.
	vendor number	Sequence number of the peer-side chip vendor.

Related Topics

5.15.8 interface atm (adsl)

5.15.8 interface atm (adsl)

Function

The **interface atm** command displays the ADSL interface view.

Format

interface atm *interface-number*

Parameters

Parameter	Description	Value
interface-number	Specifies the number of an ADSL interface.	-

Copyright © Huawei Technologies Co., Ltd.

Views

System view

Default Level

2: Configuration level

Usage Guidelines

The **interface atm** command displays the ADSL interface view.

Example

Enter the view of ADSL interface 1/0/0.

```
<Huawei> system-view
[Huawei] interface atm 1/0/0
[Huawei-Atm1/0/0]
```

Related Topics

5.15.6 display interface atm (adsl)

5.15.7 display dsl interface atm (adsl)

5.15.9 mtu (adsl)

Function

The **mtu** command sets the maximum transmission unit (MTU) for a ADSL interface.

The **undo mtu** command restores the default MTU.

By default, the MTU of a ADSL interface is 1488 bytes.

Format

mtu *mtu*

undo mtu

Parameters

Parameter	Description	Value
mtu	Specifies the MTU of a ADSL interface.	The value is an integer that ranges from 128 to 1510, in bytes.

Views

ADSL interface view

 Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The size of data frames is limited at the network layer. Any time the IP layer receives an IP packet, it checks to which local interface the packet needs to be sent and obtains the MTU configured on the interface. Then the IP layer compares the MTU with the packet length. If the packet length is longer than the MTU, the IP layer fragments the packet into smaller packets, which are shorter than the MTU.

If forcible unfragmentation is configured, some packets may be discarded during data transmission at the IP layer. Therefore, large packets must be forcibly fragmented to prevent packet loss on the network. In this case, you can run the **mtu** command to set the size of a fragment.

Follow-up Procedure

Run the **shutdown** and **undo shutdown** commands to restart the related physical interface to make the configuration take effect.

Precautions

If you run the **mtu** command multiple times in the same ADSL interface view, only the latest configuration takes effect.

After the transparent bridge is enabled on the device and the ADSL interface is added to the bridge group, the MTU cannot be greater than 1470 bytes.

Example

Set the MTU of a ADSL interface to 1200 bytes.

```
<Huawei> system-view
[Huawei] interface atm 1/0/0
[Huawei-Atm1/0/0] mtu 1200
[Huawei-Atm1/0/0] shutdown
[Huawei-Atm1/0/0] undo shutdown
```

5.15.10 xdsl auto return

Function

The **xdsl auto return** command enables the auto return function.

By default, the auto return function is disabled.

Format

xdsl auto return { **disable** | **enable** }

Parameters

Parameter	Description	Value
disable	Disables the auto return function.	-
enable	Enables the auto return function.	-

Views

User view

Default Level

0: Visit level

Usage Guidelines

This command is not supported currently, and is used for future expansion.

Example

Enable the auto return function.

```
<Huawei> xdsl auto return enable
```

5.15.11 shutdown (adsl)

Function

The **shutdown** command deactivates an ADSL interface.

The **undo shutdown** command activates an ADSL interface.

By default, an ADSL interface is activated.

Format

shutdown

undo shutdown

Parameters

None

Views

ADSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

ADSL interfaces must be activated before transmitting services. Activation of an ADSL interface refers to the training between a DSLAM and a CPE. During the training, the two devices check the line distance and status based on parameters such as the transmission standard, upstream and downstream line rates, and specified noise margin to determine whether they can work properly under the existing conditions. If the training succeeds, the ADSL interface on the CPE is activated and can transmit services between the two devices.

The device functions as a CPE and aggregates services to a DSLAM by using an ADSL interface.

After a device starts, its ADSL interface is automatically activated. The ADSL interface remains activated as long as its ADSL line works properly. To enable the device to communicate with a DSLAM, run the **shutdown** command to deactivate the ADSL interface on the device, set parameters for the interface, and then run the **undo shutdown** command to reactivate this interface to make configurations take effect.

Follow-up Procedure

After an ADSL interface is deactivated, it is disconnected from a DSLAM. To enable the ADSL interface to transmit services, reactivate this ADSL interface.

Example

Activate ADSL interface 1/0/0.

```
<Huawei> system-view
[Huawei] interface atm 1/0/0
[Huawei-Atm1/0/0] undo shutdown
```

Related Topics

5.15.8 interface atm (adsl)

5.16 VDSL Interface Configuration Commands

NOTE

The AR109, AR109W, AR109GW-L, AR129, AR129CVW, AR129CV, AR129GW-L, AR129CGVW-L, AR129W, AR169, AR169CVW, AR169CVW-4B4S, AR169EW, AR169EGW-L, AR169F, AR169BF, AR169FVW, AR169FVW-8S, AR169FGW-L, AR169G-L, AR169JFVW-4B4S, AR169JFVW-2S, AR169-P-M9, AR169W-P-M9, AR169RW-P-M9, and AR169FGVW-L support VDSL interfaces.

AR109, AR109W, AR109GW-L, AR129, AR129CVW, AR129CV, AR129GW-L, AR129CGVW-L, AR129W, AR169, AR169CVW, AR169CVW-4B4S, AR169G-L, AR169-P-M9, AR169W-P-M9, and AR169RW-P-M9 do not support T1.413.AR169EW, AR169EGW-L, AR169F, AR169BF, AR169FVW, AR169FVW-8S, AR169FGW-L, AR169JFVW-4B4S, AR169JFVW-2S, and AR169FGVW-L only support AnnexA and AnnexM. AR169BF only supports AnnexB and AnnexJ.

Copyright © Huawei Technologies Co., Ltd.

5.16.1 adsl bitswap (vdsl)

Function

The **adsl bitswap** command enables or disables bit exchange on a VDSL interface.

By default, bit exchange is enabled on a VDSL interface.

Format

adsl bitswap { **off** | **on** }

Parameters

Parameter	Description	Value
off	Disables bit exchange on a VDSL interface.	-
on	Enables bit exchange on a VDSL interface.	-

Views

VDSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

During line activation, every sub-channel calculates the signal-to-noise ratio (SNR) and the number of bits to be transmitted. After the line is activated, the SNR may change because the external environment changes. For example, the SNRs of some sub-channels reduce, whereas the SNRs of some other sub-channels increase. After a long period of time, the line may be disconnected.

The bit exchange function has the following advantages:

- Allows sub-channels failing to transmit the specified number of bits to switch some bits to sub-channels with higher SNRs.
- Reduces the transmit power of sub-channels with higher SNRs to increase the sending rate and SNRs of sub-channels with lower SNRs.

  This reduces the bit error rate without triggering line negotiation.

Prerequisites

The VDSL interface has been deactivated by using the **shutdown** command.

Follow-up Procedure

Copyright © Huawei Technologies Co., Ltd.

To make bit exchange take effect immediately on a VDSL interface, run the **undo shutdown** command to activate the VDSL interface.

Precautions

Bit exchange must be enabled on devices on both ends of a line and takes effect only after the line is activated.

Example

Disable bit exchange on VDSL interface 1/0/0.

```
<Huawei> system-view
[Huawei] interface atm 1/0/0
[Huawei-Atm1/0/0] shutdown
[Huawei-Atm1/0/0] adsl bitswap off
[Huawei-Atm1/0/0] undo shutdown
```

Related Topics

5.16.12 interface atm (vdsl)

5.16.16 shutdown (vdsl)

5.16.2 adsl sra (vdsl)

Function

The **adsl sra** command enables or disables seamless rate adaptation on a VDSL interface.

By default, seamless rate adaptation is disabled on a VDSL interface.

Format

adsl sra { **off** | **on** }

Parameters

Parameter	Description	Value
off	Disables seamless rate adaptation on a VDSL interface.	-
on	Enables seamless rate adaptation on a VDSL interface.	-

Views

VDSL interface view

Default Level

2: Configuration level

 Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

Usage Scenario

When the external environment changes, to prevent the line disconnection, use the bit exchange function to adjust bit distribution or the power among sub-channels without deactivating the line. The bit exchange function, however, cannot change the line rate. When the line environment becomes worse, the bit exchange function cannot meet the requirement for the bit error rate. The bit exchange function just allows the line to be activated at a smaller rate. When the line environment becomes better, the bit exchange function cannot adjust the rate, wasting line resources.

Seamless rate adaptation solves the preceding problem. It dynamically adjusts the line rate without reactivating the line.

Prerequisites

The VDSL interface has been deactivated by using the **shutdown** command.

Follow-up Procedure

To make seamless rate adaptation take effect immediately on a VDSL interface, run the **undo shutdown** command to activate the VDSL interface.

Precautions

Seamless rate adaptation must be enabled on devices on both ends of a line and takes effect only after the line is activated.

Example

Enable seamless rate adaptation on VDSL interface 1/0/0.

```
<Huawei> system-view
[Huawei] interface atm 1/0/0
[Huawei-Atm1/0/0] shutdown
[Huawei-Atm1/0/0] adsl sra on
[Huawei-Atm1/0/0] undo shutdown
```

Related Topics

5.16.12 interface atm (vdsl)

5.16.16 shutdown (vdsl)

5.16.3 adsl standard (vdsl)

Function

The **adsl standard** command configures a transmission standard for a VDSL interface in ATM mode.

The **undo adsl standard** command restores the default setting.

By default, the transmission standard of a VDSL interface in ATM mode is **auto**.

 Copyright © Huawei Technologies Co., Ltd.

Format

adsl standard { **adsl2** [**annexa** | **annexm** | **annexb** | **annexj** | **annexl**] | **adsl2+** [**annexa** | **annexm** | **annexb** | **annexj**] | **auto** [**over-pots** | **over-isdn**] | **gdmt** [**annexa** | **annexb**] | **t1413** }

undo adsl standard

Parameters

Parameter	Description	Value
adsl2	Specifies ADSL2 (G.992.3) as the transmission standard of a VDSL interface. ADSL2 provides faster transmission rates on the same frequency band as ADSL by improving the modulation rate, coding gain, and initialization state machine, reducing the frame head overhead, and using the enhanced signal processing algorithm. ADSL2 can provide a maximum of 1 Mbit/s upstream transmission rate and 12 Mbit/s downstream transmission rate.	-
adsl2+	Specifies ADSL2+ (G.992.5) as the transmission standard of a VDSL interface. The frequency band that ADSL2+ uses is expanded to 2.208 MHz. ADSL2+ provides a maximum of 1 Mbit/s upstream transmission rate and 24 Mbit/s downstream transmission rate.	-
annexa	Indicates that POTS services of the G.DMT, ADSL2, or ADSL2+ standard are compatible.	-
annexm	Indicates that the upstream frequency band of ADSL2 or ADSL2+ can be expanded and a maximum of 2 Mbit/s upstream transmission rate is provided.	-
annexb	Indicates that ISDN services of the G.DMT, ADSL2, or ADSL2+ standard are compatible.	-
annexj	Indicates that the upstream frequency band of ADSL2 or ADSL2+ can be expanded and ADSL2 or ADSL2+ can provide a maximum of 2.9 Mbit/s upstream transmission rate.	-

 Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
annexl	Specifies AnnexL as the transmission standard of a VDSL interface. Reach extended ADSL2 (AnnexL for short) is defined in ADSL2 recommendation. AnnexL uses a narrower frequency band and optimizes the transmit power spectrum profile to provide long-distance transmission with high performance.	-
auto	Configures a VDSL interface to automatically use the transmission standard of the remote VDSL interface. If this parameter is specified, the device selects the same transmission standard as a DSLAM from G.DMT, ADSL2, AnnexL, ADSL2+, AnnexM, and T1.413.	-
over-pots	Specifies AnnexA as the automatic transmission standard of a VDSL interface. AnnexA is also called ADSL over POTS; the low frequency band carries voice services.	-
over-isdn	Specifies AnnexB as the automatic transmission standard of a VDSL interface. AnnexB is also called ADSL over ISDN; the low frequency band carries ISDN services.	-
gdmt	Specifies G.DMT (G.992.1) as the transmission standard of a VDSL interface. G.DMT provides an upstream frequency band from 25 kHz to 138 kHz, a downstream frequency band from 138 kHz to 1.104 MHz, a maximum of 1 Mbit/s upstream transmission rate, and a maximum of 8 Mbit/s downstream transmission rate.	-
t1413	Specifies T1.413 as the transmission standard of a VDSL interface. T1.413 is a full-rate ADSL protocol, and provides a maximum of 800 kbit/s upstream transmission rate and 8 Mbit/s downstream transmission rate.	-

 Copyright © Huawei Technologies Co., Ltd.

Views

VDSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

To ensure that service flows are properly transmitted on a VDSL, run the **adsl standard** command to configure the transmission standard of a VDSL interface in ATM mode to be the same as that of the remote interface. You are advised to configure a VDSL interface to automatically use the transmission standard of the remote interface.

Precautions

AR109, AR109W, AR109GW-L, AR129, AR129CVW, AR129CV, AR129GW-L, AR129CGVW-L, AR129W, AR169, AR169CVW, AR169CVW-4B4S, AR169G-L, AR169-P-M9, AR169W-P-M9, and AR169RW-P-M9 do not support T1.413.AR169EW, AR169EGW-L, AR169F, AR169BF, AR169FVW, AR169FVW-8S, AR169FGW-L, AR169JFVW-4B4S, AR169JFVW-2S, and AR169FGVW-L only support AnnexA and AnnexM. AR169BF only supports AnnexB and AnnexJ.

When a VDSL line carries voice or ISDN services and the VDSL interface is configured to work in auto mode, the interface cannot go Up. In this case, specify the **over-pots** and **over-isdn** parameters in the command, respectively.

Prerequisites

The VDSL interface has been deactivated using the **shutdown** command.

Follow-up Procedure

To make the transmission standard configured for a VDSL interface take effect, run the **undo shutdown** command on the interface to activate the interface.

Example

Configure VDSL interface 1/0/0 to use the transmission standard T1.413.

```
<Huawei> system-view
[Huawei] set workmode slot 1 vdsl atm
Warning: Changing the working mode will reset the board in slot 1. Continue? [y/
n]:y
INFO: Resetting board[1] succeeded.
[Huawei] interface atm 1/0/0
[Huawei-Atm1/0/0] shutdown
[Huawei-Atm1/0/0] adsl standard t1413
[Huawei-Atm1/0/0] undo shutdown
```

Related Topics

5.16.12 interface atm (vdsl)

5.16.16 shutdown (vdsl)

 Copyright © Huawei Technologies Co., Ltd.

5.16.4 adsl trellis (vdsl)

Function

The **adsl trellis** command enables or disables trellis coding on a VDSL interface in ATM mode.

By default, trellis coding is enabled on a VDSL interface in ATM mode.

Format

adsl trellis { **off** | **on** }

Parameters

Parameter	Description	Value
off	Disables trellis coding on a VDSL interface.	-
on	Enables trellis coding on a VDSL interface.	-

Views

VDSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Trellis coding increases the signal noise ratio (SNR) by using a coding algorithm with a high coding efficiency. After trellis coding is enabled, the line activation rate is greatly increased.

Prerequisites

The VDSL interface has been deactivated by using the **shutdown** command.

Follow-up Procedure

To make trellis coding take effect immediately on a VDSL interface, run the **undo shutdown** command to activate the VDSL interface.

Precautions

Trellis coding must be enabled on devices on both ends of a line and takes effect only after the line is activated.

Copyright © Huawei Technologies Co., Ltd.

As specified in ADSL2 (G.992.3) and ADSL2+ (G.992.5) standards, trellis coding must be enabled. Under normal circumstances, it is recommended that you do not disable trellis coding; otherwise, interface connection problems may occur.

Example

Disable trellis coding on VDSL interface 1/0/0.

```
<Huawei> system-view
[Huawei] interface atm 1/0/0
[Huawei-Atm1/0/0] shutdown
[Huawei-Atm1/0/0] adsl trellis off
[Huawei-Atm1/0/0] undo shutdown
```

Related Topics

5.16.16 shutdown (vdsl)

5.16.5 display dsl all interface

Function

The **display dsl all interface** command displays status information about all xDSL interfaces.

Format

display dsl all interface

Parameters

None

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

Usage Scenario

You can run the **display dsl all interface** command to check the negotiation status with xDSL interfaces at the central office, transmission standard, line status, performance statistics, bit exchange status, seamless rate adaptation status, trellis coding status, and card version of the ADSL interface and VDSL interface (in ATM or PTM mode), and check the link status, vendor, and performance statistics of the G.SHDSL interface.

Precautions

This command cannot display information about xDSL sub-interfaces.

 Copyright © Huawei Technologies Co., Ltd.

Example

Display status information about all xDSL interfaces.

```
<Huawei> display dsl all interface
 Atm1/0/0 information:
 ------------------------------------------------------------
 DSL driver and PHY status
     Line0:
     Training status                  : Showtime
     Transmission mode                : VDSL2
     VDSL2 profile                    : Profile 17a
     Line status                      : No Defect
     Downstream max. attainable rate(Kbps): 142372
     Upstream max. attainable rate(Kbps)  : 63853
     Downstream actual net data rate(Kbps): 60016
     Upstream actual net data rate(Kbps)  : 20013
     Downstream SNR margin(dB)            : 28.8
     Upstream SNR margin(dB)              : 31.9
     Downstream attenuation(dB)           : 0.0
     Upstream attenuation(dB)             : 0.0
     Downstream output power(dBm)         : 14.5
     Upstream output power(dBm)           : -6.4
     Downstream total cells               : 1348781845
     Upstream total cells                 : 0
     Downstream data cells                : 0
     Upstream data cells                  : 0
     Downstream bit errors                : 0
     Upstream bit errors                  : 0
     Total drop cells                     : 0
     Downstream total ES count            : 60
     Upstream total ES count              : 0
     Downstream total SES count           : 59
     Upstream total SES count             : 0
     Downstream total UAS count           : 849
     Upstream total UAS count             : 849
     Total AS count                       : 86128

     Line1:
     Training status                  : Showtime
     Transmission mode                : VDSL2
     VDSL2 profile                    : Profile 17a
     Line status                      : No Defect
     Downstream max. attainable rate(Kbps): 145984
     Upstream max. attainable rate(Kbps)  : 64009
     Downstream actual net data rate(Kbps): 60016
     Upstream actual net data rate(Kbps)  : 20013
     Downstream SNR margin(dB)            : 28.0
     Upstream SNR margin(dB)              : 32.4
     Downstream attenuation(dB)           : 0.0
     Upstream attenuation(dB)             : 0.0
     Downstream output power(dBm)         : 13.1
     Upstream output power(dBm)           : -6.5
     Downstream total cells               : 1360438742
     Upstream total cells                 : 0
     Downstream data cells                : 0
     Upstream data cells                  : 0
     Downstream bit errors                : 0
     Upstream bit errors                  : 0
     Total drop cells                     : 0
     Downstream total ES count            : 59
     Upstream total ES count              : 0
     Downstream total SES count           : 56
     Upstream total SES count             : 0
     Downstream total UAS count           : 683
     Upstream total UAS count             : 683
     Total AS count                       : 86230

 Line capability
```

 Copyright © Huawei Technologies Co., Ltd.

```
    Bitswap                        : On
    SRA                           : Off
    Trellis coding                 : On

Board version
    vendor ID                      : 0xB5 0 "BDCM" 0 0
    vendor serial                  : 10000000000000000000000000000000
    Board ID                      : 963168MBV_17A
    Software version                 : 4.12L.08
    Bootloader (CFE) version          : 1.0.38-112.118
    DSL PHY and driver version         : A2pvbF038j.d24h
    Build timestamp                 : 20170706_1814

ATU-C version
    vendor ID                      : BDCM:0x938f
    vendor number                    : 0x938f
-------------------------------------------------------------
Atm2/0/1 information:
-------------------------------------------------------------------
 Operating mode                          :CPE
 Port admin status                      :Active
 Port running status                    :Activated
 Port admin bind status                   :EFM-2
 Bind group master port                   :0
 Bind group running port                  :1;
 LOSWS Defect alarm                       :none
 SNR Margin alarm                        :none
 Loop Attenuation alarm                    :none
 Modem status                           :DOWN_READY
 Condition                             :NO_COND_
 Reason                                :ERR_UNUSED_
 Port transmission mode                      :G.991.2 Annex A&B&F&G
 Port power spectral density                 :Symmetric
 Port line probe                        :Enable
 Inventory of SHDSL port 0
 Vendor ID                             :Infineon
 Vendor mode                             :SOCRATES
 Vendor serial                          :4e_2e_1e
 EOC version                            :0
 Standard version                         :8
 Vendor list                           :-
 Vendor issue                            :1
 Software code                           :1.7.2
 Equipment code                           :-
 Information of other vendor                :V200R008
 Transmission mode capability                :G.991.2 Annex A&B&F&G
-------------------------------------------------------------
```

Table 5-52 Description of the **display dsl all interface** command output

Item	Description
Atm1/0/0 information	Information about ATM1/0/0. ATM1/0/0 in this example is a VDSL interface. For detailed command output descriptions, see **display dsl interface atm (vdsl)** and **display dsl interface ethernet (vdsl)**. For detailed command output description of an ADSL interface, see **display dsl interface atm (adsl)**.
Atm2/0/1 information	Information about ATM2/0/1. ATM2/0/1 in this example is a G.SHDSL interface. For detailed command output description, see **display dsl interface (g.shdsl)**.

 Copyright © Huawei Technologies Co., Ltd.

5.16.6 display dsl interface atm (vdsl)

Function

The **display dsl interface atm** command displays information about a VDSL interface in ATM mode.

Format

display dsl interface atm *interface-number*

Parameters

Parameter	Description	Value
interface-number	Specifies the interface number of the VDSL interface in ATM mode.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

The **display dsl interface atm** command displays the training status, transmission standard, line status, performance statistics, bit exchange status, seamless rate adaptation status, trellis coding status, and board version of the VDSL interface.

Example

Display information about VDSL interface 1/0/0 in ATM mode.

```
<Huawei> display dsl interface atm 1/0/0
 ------------------------------------------------------------------
 DSL Connection Status
     DSL sync count                    : 1
     DSL up time: 0 day(s) 0 hour(s)
                  2 minute(s) 1 second(s)
 DSL driver and PHY status
     Training Status                   : Showtime
     Transmission Mode                 : ADSL2
     Line Status                       : No Defect
     Downstream max. attainable rate(Kbps): 132740
     Upstream max. attainable rate(Kbps)  : 44503
     Downstream actual net data rate(Kbps): 51399
     Upstream actual net data rate(Kbps)  : 25708
     Downstream SNR margin(dB)         : 28.8
     Upstream SNR margin(dB)           : 27.0
     Downstream attenuation(dB)        : 0.0
     Upstream attenuation(dB)          : 0.0
```


Copyright © Huawei Technologies Co., Ltd.

```
    Downstream output power(dBm)         : 7.5
    Upstream output power(dBm)           : -4.8
    Downstream total cells               : 826623466
    Upstream total cells                 : 413437274
    Downstream data cells                : 672651340
    Upstream data cells                  : 246036145
    Downstream bit errors                : 0
    Upstream bit errors                  : 0
    Total drop cells                     : 0
    Downstream total ES count            : 0
    Upstream total ES count              : 0
    Downstream total SES count           : 0
    Upstream total SES count             : 0
    Downstream total UAS count           : 31
    Upstream total UAS count             : 31
    Total AS count                       : 6820
    Downstream CRC errors                : 0
    Upstream CRC errors                  : 0
    Downstream FEC count                 : 0
    Upstream FEC count                   : 0

Line modulations
    G.Dmt                                : Enabled
    T1.413                               : Enabled
    ADSL2                                : Enabled
    AnnexL                               : Enabled
    ADSL2+                               : Enabled
    AnnexM                               : Enabled

Line capability
    Bitswap                              : On
    SRA                                  : Off
    Trellis coding                       : On

Board version
    vendor ID                            : BDCM:0x938f
    vendor number                        : 0x938f
    Board ID:                            : 963281TAN
    Software version                     : 4.06L.03
    Bootloader (CFE) version             : 1.0.37-106.24
    DSL PHY and driver version           : A2pD033a.d23c
    Build timestamp                      : 20110221_2122

ATU-C version
    vendor ID                            : BDCM:0x938f
    vendor number                        : 0x938f
-------------------------------------------------------------
```

Table 5-53 Description of the **display dsl interface atm** command output

Item	Sub-item	Description
DSL Connection Status	DSL sync count	Total number of times that the DSL link synchronization.
	DSL up time	The total time of consecutive times that the DSL link up.

 Copyright © Huawei Technologies Co., Ltd.

Item	Sub-item	Description
DSL driver and PHY status	Training Status	Training status of the VDSL interface: • Idle: indicates that the VDSL interface is idle. • Training: indicates that the VDSL interface is negotiating with the remote VDSL interface. • Showtime: indicates that negotiation between the two VDSL interfaces succeeds. • NoSignal: indicates that there is no signal. • Disabled: indicates that the **shutdown (vdsl)** command is executed on the VDSL interface. **NOTE** Other sub-items of **DSL driver and PHY status** can be displayed only after negotiation between the local and remote VDSL interfaces succeeds.

 Copyright © Huawei Technologies Co., Ltd.

Item	Sub-item	Description
	Transmission mode	Transmission standard of the VDSL interface: • ADSL2: provides a maximum of 1 Mbit/s upstream transmission rate and 12 Mbit/s downstream transmission rate. • ADSL2 AnnexM: expands the upstream frequency band of ADSL2 and provides a maximum of 2 Mbit/s upstream transmission rate. • RE-ADSL2: is defined in ADSL2 recommendation. It uses a narrower frequency band and optimizes the power spectral density (PSD) mask to provide long-distance transmission of high performance. • ADSL2+: provides a maximum of 1 Mbit/s upstream transmission rate and 24 Mbit/s downstream transmission rate. • ADSL2+ AnnexM: expands the upstream frequency band of ADSL2+ and provides a maximum of 2 Mbit/s upstream transmission rate. • G.DMT: provides a maximum of 1 Mbit/s upstream transmission rate and 8 Mbit/s downstream transmission rate. • T1.413: provides a maximum of 800 kbit/s upstream transmission rate and 8 Mbit/s downstream transmission rate. To configure the transmission standard, run the **adsl standard (vdsl)** command.
	Line Status	Line status of the VDSL interface: • No Defect: indicates that the VDSL interface has been activated. • Loss of Frame: indicates that frames are lost. • Loss of Signal: indicates that signals are lost. • Loss of Power: indicates that the device is powered off. • Loss of Signal Quality: indicates that the signal quality is low.

Copyright © Huawei Technologies Co., Ltd.

Item	Sub-item	Description
	Downstream max. attainable rate(Kbps)	Maximum downstream transmission rate (in kbit/s).
	Upstream max. attainable rate(Kbps)	Maximum upstream transmission rate (in kbit/s).
	Downstream actual net data rate(Kbps)	Actual downstream transmission rate (in kbit/s).
	Upstream actual net data rate(Kbps)	Actual upstream transmission rate (in kbit/s).
	Downstream SNR margin(dB)	Downstream noise margin (dB).
	Upstream SNR margin(dB)	Upstream noise margin (dB).
	Downstream attenuation(dB)	Downstream attenuation (dB).
	Upstream attenuation(dB)	Upstream attenuation (dB).
	Downstream output power(dBm)	Downstream output power (dBm).
	Upstream output power(dBm)	Upstream output power (dBm).
	Downstream total cells	Total number of downstream cells.
	Upstream total cells	Total number of upstream cells.
	Downstream data cells	Number of downstream data cells.
	Upstream data cells	Number of upstream data cells.
	Downstream bit errors	Downstream bit errors.
	Upstream bit errors	Upstream bit errors.
	Total drop cells	Total number of dropped cells.

 Copyright © Huawei Technologies Co., Ltd.

Item	Sub-item	Description
	Downstream total ES count	Total number of downstream errored seconds.
	Upstream total ES count	Total number of upstream errored seconds.
	Downstream total SES count	Total number of downstream severely errored seconds.
	Upstream total SES count	Total number of upstream severely errored seconds.
	Downstream total UAS count	Total number of downstream unavailable seconds.
	Upstream total UAS count	Total number of upstream unavailable seconds.
	Total AS count	Total number of available seconds.
	Downstream CRC errors	Total number of downstream CRC errors.
	Upstream CRC errors	Total number of upstream CRC errors.
	Downstream FEC count	Total number of downstream FEC errors.
	Upstream FEC count	Total number of upstream FEC errors.
Line modulations	G.Dmt	Status of the transmission standards supported by the VDSL interface: • If the device is configured to automatically adapt to the transmission standard of the DSLAM, G.Dmt, T1.413, ADSL2, AnnexL, ADSL2+, and AnnexM are enabled. The device then selects the same transmission standard as the DSLAM from the preceding transmission standards. You can know which transmission standard is selected by viewing the **Transmission mode** field. • If a transmission standard is specified for the VDSL interface, only this transmission standard is enabled.
	T1.413	
	ADSL2	
	AnnexL	
	ADSL2+	
	AnnexM	

 Copyright © Huawei Technologies Co., Ltd.

Item	Sub-item	Description
Line capability	Bitswap	Bit exchange status: • On: enabled • Off: disabled To configure bit exchange, run the **adsl bitswap (vdsl)** command.
	SRA	Seamless rate adaptation status: • On: enabled • Off: disabled To configure seamless rate adaptation, run the **adsl sra (vdsl)** command.
	Trellis coding	Trellis coding status: • On: enabled • Off: disabled To configure trellis coding, run the **adsl trellis (vdsl)** command.
Board version	vendor ID	ID of the peer-side chip vendor.
	vendor number	Sequence number of the peer-side chip vendor.
	Board ID	Board ID.
	Software version	System software version.
	Bootloader (CFE) version	BootRom version.
	DSL PHY and driver version	Board driver version.
	Build timestamp	Time the board is registered.
ATU-C version	vendor ID	ID of the peer-side chip vendor.
	vendor number	Sequence number of the peer-side chip vendor.

Related Topics

5.16.12 interface atm (vdsl)

5.16.7 display dsl hlog interface

Function

The **display dsl hlog interface** command displays information about the HLog parameter of a VDSL interface.

Copyright © Huawei Technologies Co., Ltd.

Format

display dsl hlog interface { **atm** | **ethernet** } *interface-number* [**from** *tone-num* **to** *tone-num*]

Parameters

Parameter	Description	Value
{ **atm** | **ethernet** } *interface-number*	Specifies the number of a DSL interface working in the ATM or PTM mode.	-
from *tone-num* **to** *tone-num*	Specifies the tone start number of a DSL interface that needs to be displayed. A maximum number of 50 tone records can be displayed.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

Viewing information about the HLog parameter of an interface helps users to determine the quality of DSL links based on the actual link requirement and take corresponding measures to improve the quality of DSL links. The measures include restarting the DSL interface links and replacing the DSL cables.

Example

Display information about the HLog parameter of the VDSL interface ATM 1/0/0.

```
<Huawei> display dsl hlog interface atm 1/0/0 from 0 to 19
Showing up to 50 records.
Tone number      HLog
  0          -96.0000
  1          -96.0000
  2          -96.0000
  3          -96.0000
  4          -96.0000
  5          -96.0000
  6          -96.0000
  7          -96.2500
  8          -4.0625
  9          -4.0625
```

 Copyright © Huawei Technologies Co., Ltd.

```
10      -4.0625
11      -4.0625
12      -4.0625
13      -4.0625
14      -4.0625
15      -4.0625
16      -0.1875
17      -0.1875
18      -0.1875
19      -0.1875
```

Table 5-54 Description of the **display dsl hlog interface** command output

Item	Description
Showing up to 50 records.	Displays a maximum number of 50 records about the HLog parameter of an interface.
Tone number HLog	Displays information about the HLog parameter corresponding to the tone number of an interface.

Related Topics

5.16.9 display dsl qln interface

5.16.8 display dsl interface ethernet (vdsl)

Function

The **display dsl interface ethernet** command displays information about a VDSL interface in PTM mode.

Format

display dsl interface ethernet *interface-number*

Parameters

Parameter	Description	Value
interface-number	Specifies the interface number of the VDSL interface in PTM mode.	-

Views

All views

Default Level

1: Monitoring level

Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

The **display dsl interface ethernet** command displays the training status, transmission standard, line status, performance statistics, bit exchange status, seamless rate adaptation status, trellis coding status, and board version of the VDSL interface.

Example

Display information about VDSL interface 0/0/0 in PTM mode. The following uses the VDSL interface on the AR169F as an example.

```
<Huawei> display dsl interface ethernet 0/0/0
-------------------------------------------------------------
DSL driver and PHY status
    Training status                  : Showtime
    Transmission mode                  : VDSL2 AnnexA
    VDSL2 profile                    : Profile 17a
    Line status                    : No Defect
    Downstream max. attainable rate(Kbps): 142372
    Upstream max. attainable rate(Kbps)  : 63853
    Downstream actual net data rate(Kbps): 60016
    Upstream actual net data rate(Kbps)  : 20013
    Downstream SNR margin(dB)          : 28.8
    Upstream SNR margin(dB)          : 31.9
    Downstream attenuation(dB)         : 0.0
    Upstream attenuation(dB)         : 0.0
    Downstream output power(dBm)       : 14.5
    Upstream output power(dBm)         : -6.4
    Downstream total cells           : 1348781845
    Upstream total cells             : 0
    Downstream data cells              : 0
    Upstream data cells              : 0
    Downstream bit errors              : 0
    Upstream bit errors              : 0
    Total drop cells                 : 0
    Downstream total ES count          : 60
    Upstream total ES count          : 0
    Downstream total SES count         : 59
    Upstream total SES count         : 0
    Downstream total UAS count         : 849
    Upstream total UAS count         : 849
    Total AS count                   : 86128

Line modulations
    VDSL2                          : Enabled
    AnnexA                         : Enabled
    AnnexB                         : Enabled

Line capability
    Bitswap                        : On
    SRA                            : Off
    Trellis coding                   : On

Board version
    vendor ID                        : 0xB5 0 "BDCM" 0 0
    vendor serial                    : 10000000000000000000000000000000
    Board ID                       : 963168MBV_17A
    Software version                   : 4.12L.08
    Bootloader (CFE) version           : 1.0.38-112.118
    DSL PHY and driver version         : A2pvbF038j.d24h

ATU-C version
    vendor ID                        : BDCM:0x938f
    vendor number                      : 0x938f
-------------------------------------------------------------
```

 Copyright © Huawei Technologies Co., Ltd.

Table 5-55 Description of the display dsl interface ethernet 0/0/0 command output

Item	Sub-item	Description
DSL driver and PHY status	Line0	One of two lines of the VDSL interface in PTM mode, Line0.
	Training Status	Training status of the VDSL interface: • Idle: indicates that the VDSL interface is idle. • Training: indicates that the VDSL interface is negotiating with the remote VDSL interface. • Showtime: indicates that negotiation between the two VDSL interfaces succeeds. • NoSignal: indicates that there is no signal. • Disabled: indicates that the **shutdown (vdsl)** command is executed on the VDSL interface. **NOTE** Other sub-items of **DSL driver and PHY status** can be displayed only after negotiation between the local and remote VDSL interfaces succeeds.
	Transmission mode	Transmission standard of the VDSL interface: • VDSL2: provides a maximum of 100 Mbit/s upstream transmission rate and 100 Mbit/s downstream transmission rate. • VDSL2 AnnexA: provides a maximum of 100 Mbit/s upstream transmission rate and 100 Mbit/s downstream transmission rate, supports VDSL2, and is compatible with POTS services. • VDSL2 AnnexB: provides a maximum of 100 Mbit/s upstream transmission rate and 100 Mbit/s downstream transmission rate, supports VDSL2, and is compatible with ISDN services. To configure the transmission standard, run the **vdsl standard** command.
	VDSL2 profile	Spectrum distribution profile.

Copyright © Huawei Technologies Co., Ltd.

Item	Sub-item	Description
	Line Status	Line status of the VDSL interface: • No Defect: indicates that the VDSL interface has been activated. • Loss of Frame: indicates that frames are lost. • Loss of Signal: indicates that signals are lost. • Loss of Power: indicates that the device is powered off. • Loss of Signal Quality: indicates that the signal quality is low.
	Downstream max. attainable rate(Kbps)	Maximum downstream transmission rate (in kbit/s).
	Upstream max. attainable rate(Kbps)	Maximum upstream transmission rate (in kbit/s).
	Downstream actual net data rate(Kbps)	Actual downstream transmission rate (in kbit/s).
	Upstream actual net data rate(Kbps)	Actual upstream transmission rate (in kbit/s).
	Downstream SNR margin(dB)	Downstream noise margin (dB).
	Upstream SNR margin(dB)	Upstream noise margin (dB).
	Downstream attenuation(dB)	Downstream attenuation (dB).
	Upstream attenuation(dB)	Upstream attenuation (dB).
	Downstream output power(dBm)	Downstream output power (dB).
	Upstream output power(dBm)	Upstream output power (dB).
	Downstream total cells	Total number of downstream cells.
	Upstream total cells	Total number of upstream cells.

 Copyright © Huawei Technologies Co., Ltd.

Item	Sub-item	Description
	Downstream data cells	Number of downstream data cells.
	Upstream data cells	Number of upstream data cells.
	Downstream bit errors	Downstream bit errors.
	Upstream bit errors	Upstream bit errors.
	Total drop cells	Total number of dropped cells.
	Downstream total ES count	Total number of downstream errored seconds.
	Upstream total ES count	Total number of upstream errored seconds.
	Downstream total SES count	Total number of downstream severely errored seconds.
	Upstream total SES count	Total number of upstream severely errored seconds.
	Downstream total UAS count	Total number of downstream unavailable seconds.
	Upstream total UAS count	Total number of upstream unavailable seconds.
	Total AS count	Total number of available seconds.
	Line1	One of two lines of the VDSL interface in PTM mode, Line1.
Line modulations	VDSL2	Status of the transmission standards supported by the VDSL interface: • If the device is configured to automatically adapt to the transmission standard of the VDSL2, AnnexA, and AnnexB are enabled. The device then selects the same transmission standard as the DSLAM from the preceding transmission standards. You can know which transmission standard is selected by viewing the **Transmission mode** field. • If a transmission standard is specified for the VDSL interface, only this transmission standard is enabled.
	AnnexA	
	AnnexB	

Copyright © Huawei Technologies Co., Ltd.

Item	Sub-item	Description
Line capability	Bitswap	Bit exchange status: • On: enabled • Off: disabled To configure bit exchange, run the **adsl bitswap (vdsl)** command.
	SRA	Seamless rate adaptation status: • On: enabled • Off: disabled To configure seamless rate adaptation, run the **adsl sra (vdsl)** command.
	Trellis coding	Trellis coding status: • On: enabled • Off: disabled To configure trellis coding, run the **adsl trellis (vdsl)** command.
Board version	vendor ID	Vendor ID.
	vendor serial	Device serial number.
	Board ID	Board ID.
	Software version	System software version.
	Bootloader (CFE) version	BootROM version.
	DSL PHY and driver version	Board driver version.
	Build timestamp	Time the board is registered.
ATU-C version	vendor ID	ID of the peer-side chip vendor.
	vendor number	Sequence number of the peer-side chip vendor.

Related Topics

5.16.13 interface ethernet (vdsl)

5.16.9 display dsl qln interface

Function

The **display dsl qln interface** command displays information about the QLN parameter of a DSL interface.

Copyright © Huawei Technologies Co., Ltd.

Format

display dsl qln interface { **atm** | **ethernet** } *interface-number* [**from** *tone-num* **to** *tone-num*]

Parameters

Parameter	Description	Value
{ **atm** | **ethernet** } *interface-number*	Specifies the number of a DSL interface working in the ATM or PTM mode.	-
from *tone-num* **to** *tone-num*	Specifies the tone start number of a DSL interface that needs to be displayed. A maximum number of 50 tone records can be displayed.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

Viewing information about the QLN parameter of an interface helps users to determine the quality of DSL links based on the actual link requirement and take corresponding measures to improve the quality of DSL links. The measures include restarting the DSL interface links and replacing the DSL cables.

Example

Display information about the QLN parameter of the VDSL interface Ethernet 0/0/0.

```
<Huawei> display dsl qln interface Ethernet 0/0/0 from 4045 to 4095
Showing up to 50 records.
Tone number      QLN
  4045        -160.0000
  4046        -160.0000
  4047        -160.0000
  4048        -160.0000
  4049        -160.0000
  4050        -160.0000
  4051        -160.0000
  4052        -160.0000
  4053        -160.0000
  4054        -160.0000
```

 Copyright © Huawei Technologies Co., Ltd.

```
4055      -160.0000
4056      -160.0000
4057      -160.0000
4058      -160.0000
4059      -160.0000
4060      -160.0000
4061      -160.0000
4062      -160.0000
4063      -160.0000
4064      -160.0000
4065      -160.0000
4066      -160.0000
4067      -160.0000
4068      -160.0000
4069      -160.0000
4070      -160.0000
4071      -160.0000
4072      -160.0000
4073      -160.0000
4074      -160.0000
4075      -160.0000
4076      -160.0000
4077      -160.0000
4078      -160.0000
4079      -160.0000
4080      -160.0000
4081      -160.0000
4082      -160.0000
4083      -160.0000
4084      -160.0000
4085      -160.0000
4086      -160.0000
4087      -160.0000
4088      -160.0000
4089      -160.0000
4090      -160.0000
4091      -160.0000
4092      -160.0000
4093      -160.0000
4094      -160.0000
```

Table 5-56 Description of the **display dsl qln interface** command output

Item	Description
Showing up to 50 records.	Displays a maximum number of 50 records about the QLN parameter of an interface.
Tone number QLN	Displays information about the QLN parameter corresponding to the tone number of an interface.

Related Topics

5.16.7 display dsl hlog interface

5.16.10 display interface atm (vdsl)

Function

The **display interface atm** command displays the configuration and status of a VDSL interface.

Copyright © Huawei Technologies Co., Ltd.

Format

display interface atm *interface-number*

Parameters

Parameter	Description	Value
interface-number	Specifies the number of a VDSL interface.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

Usage Scenario

When monitoring the interface status or locating faults on a VDSL interface, run the **display interface atm** command on the interface. You can collect traffic statistics and locate faults on the interface according to the command output.

Prerequisites

The VDSL interface is working in ATM mode.

Example

Display the configuration and status of VDSL interface 1/0/0.

```
<Huawei> display interface atm 1/0/0
Atm1/0/0 current state : DOWN
Line protocol current state : DOWN
Description:HUAWEI, AR Series, Atm1/0/0 Interface
Route Port,The Maximum Transmit Unit is 1500
Internet Address is 1.1.1.1/24
AAL enabled: AAL5, Maximum PVCs: 16
PVCs on main-interface: 1 (Total PVCs: 4)
Last physical up time   : 2012-12-31 17:46:27
Last physical down time : 2013-01-04 16:56:29
Current system time: 2013-01-06 14:06:26

Port PHY type    : VDSL
The physical up times since the system startup : 1
Last 300 seconds input rate 0 bits/sec, 0 packets/sec
Last 300 seconds output rate 0 bits/sec, 0 packets/sec

Input:  211359250 packets, 30040764364 bytes
  OAM Cells:           1918511,  ASM Cells:                0
  Packet Errors:             4,  Packet Discards:          4
  Cell Errors:             636

Output:  211353924 packets, 30617567900 bytes
  OAM Cells:           1918502,  ASM Cells:                0
```

 Copyright © Huawei Technologies Co., Ltd.

```
Packet Errors:              0,  Packet Discards:            0
  Input bandwidth utilization  :    0%
  Output bandwidth utilization :    0%
```

Table 5-57 Description of the display interface atm command output

Item	Description
Atm1/0/0 current state	Physical status of ATM1/0/0: • UP: indicates that the interface is physically Up. • DOWN: indicates that the interface is physically Down. • Administratively down: indicates that the network administrator has run the **shutdown** command on the interface.
Line protocol current state	Link layer protocol status of the interface: • UP: indicates that the link layer protocol status of the interface is Up. • DOWN: indicates that the link layer protocol status of the interface is Down or no IP address is assigned to the interface.
Description	Interface description. The description contains a maximum of 242 case-sensitive characters, with spaces supported. This field describes functions of the VDSL interface.
The Maximum Transmit Unit is	Maximum transmit unit (MTU) of the interface. By default, the MTU is 1488 bytes. Packets whose size is greater than the MTU are fragmented before being transmitted. If non-fragmentation is configured, these packets are discarded.
Internet Address is	IP address of the interface. If no IP address is assigned to the interface, the system displays "Internet protocol processing : disabled".
AAL enabled	ATM Adaptation Layer (AAL). **NOTE** The device supports only AAL5.
Maximum PVCs	Maximum number of virtual circuits (PVCs).
PVCs on main-interface: (Total PVCs:)	Number of PVCs on the main interface (total number of PVCs on both the main interface and sub-interfaces).

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
Last physical up time	Last time the interface went Up physically. If the value of this field is displayed as "-", the physical status of the interface does not change. If the time zone is configured and the daylight saving time is used, the time is in YYYY-MM-DD HH:MM:SS UTC±HH:MM DST format.
Last physical down time	Last time the interface went Down physically. If the value of this field is displayed as "-", the physical status of the interface does not change. If the time zone is configured and the daylight saving time is used, the time is in YYYY-MM-DD HH:MM:SS UTC±HH:MM DST format.
Current system time	Current system time. If the time zone is configured and the daylight saving time is used, the time is in YYYY-MM-DD HH:MM:SS UTC±HH:MM DST format.
Port PHY type	Physical type of the interface.
The physical uptimes since the system startup	Number of times that interface becomes Up after the system starts.
OAM Cells	Number of OAM cells.
ASM Cells	Number of incoming autonomous status message (ASM) cells.
Packet Errors	Number of error packets.
Packet Discards	Number of discard packets.
Cell Errors	Number of error cells.
Input bandwidth utilization	Percentage of the incoming packet rate to the total bandwidth.
Output bandwidth utilization	Percentage of the outgoing packet rate to the total bandwidth.

Related Topics

5.16.12 interface atm (vdsl)

5.16.11 display interface ethernet (vdsl)

Function

The **display interface ethernet** command displays the configuration and status of a VDSL interface working in PTM mode.

Copyright © Huawei Technologies Co., Ltd.

Format

display interface ethernet *interface-number*

Parameters

Parameter	Description	Value
interface-number	Specifies the number of a VDSL interface working in PTM mode.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

Usage Scenario

When monitoring the interface status or locating faults on a VDSL interface, run the **display interface ethernet** command on the interface. You can collect traffic statistics and locate faults on the interface according to the command output.

Prerequisites

The VDSL interface is working in PTM mode.

Example

Display the configuration and status of VDSL interface 1/0/0 working in PTM mode.

```
<Huawei> display interface ethernet 1/0/0
Ethernet1/0/0 current state : UP
Line protocol current state : DOWN
Description:HUAWEI, AR Series, Ethernet1/0/0 Interface
Route Port,The Maximum Transmit Unit is 1500
Internet protocol processing : disabled
IP Sending Frames' Format is PKTFMT_ETHNT_2, Hardware address is 5678-9876-2345
Last physical up time   : 2011-01-03 17:40:01
Last physical down time : 2011-01-03 17:39:33
Current system time: 2011-01-03 18:24:47

Port PHY type    : VDSL
Last 300 seconds input rate 0 bits/sec, 0 packets/sec
Last 300 seconds output rate 0 bits/sec, 0 packets/sec

Input:  0 packets, 0 bytes
  OAM Cells:               0,  ASM Cells:               0
  Packet Errors:           0,  Cell Errors:             0

Output:  0 packets, 0 bytes
  OAM Cells:               0,  ASM Cells:               0
```

 Copyright © Huawei Technologies Co., Ltd.

```
Input bandwidth utilization :    0%
Output bandwidth utilization :    0%
```

Table 5-58 Description of the **display interface ethernet** command output

Item	Description
Ethernet1/0/0 current state	Physical status of Ethernet1/0/0: • UP: indicates that the interface is physically Up. • DOWN: indicates that the interface is physically Down. • Administratively down: indicates that the network administrator has run the **shutdown** command on the interface.
Line protocol current state	Link layer protocol status of the interface: • UP: indicates that the link layer protocol status of the interface is Up. • DOWN: indicates that the link layer protocol status of the interface is Down or no IP address is assigned to the interface.
Description	Interface description.
The Maximum Transmit Unit is	Maximum transmit unit (MTU) of the interface. By default, the MTU is 1488 bytes. Packets whose size is greater than the MTU are fragmented before being transmitted. If non-fragmentation is configured, these packets are discarded.
Internet protocol processing	• If no IP address is assigned to the interface, the system displays "disable." • If an IP address is assigned to the interface, the IP address and subnet mask are displayed.
IP Sending Frames' Format is	Format of the frame contained in the sent IP packet.
Last physical up time	Last time the interface went Up physically. If the value of this field is displayed as "-", the physical status of the interface does not change. If the time zone is configured and the daylight saving time is used, the time is in YYYY-MM-DD HH:MM:SS UTC±HH:MM DST format.
Last physical down time	Last time the interface went Down physically. If the value of this field is displayed as "-", the physical status of the interface does not change. If the time zone is configured and the daylight saving time is used, the time is in YYYY-MM-DD HH:MM:SS UTC±HH:MM DST format.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Current system time	Current system time. If the time zone is configured and the daylight saving time is used, the time is in YYYY-MM-DD HH:MM:SS UTC±HH:MM DST format.
Port PHY type	Physical port type.
OAM Cells	Number of OAM cells.
ASM Cells	Number of incoming autonomous status message (ASM) cells.
Packet Errors	Number of error packets.
Cell Errors	Number of error cells.
Input bandwidth utilization	Percentage of the incoming packet rate to the total bandwidth.
Output bandwidth utilization	Percentage of the outgoing packet rate to the total bandwidth.

Related Topics

5.16.13 interface ethernet (vdsl)

5.16.12 interface atm (vdsl)

Function

The **interface atm** command displays the view of a VDSL interface working in ATM mode.

Format

interface atm *interface-number*

Parameters

Parameter	Description	Value
interface-number	Specifies the number of a VDSL interface working in ATM mode.	-

Views

System view

Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The **interface atm** command displays the view of a VDSL interface working in ATM mode.

Prerequisites

The VDSL interface has been configured to work in ATM mode by using the **5.16.15 set workmode vdsl** command.

By default, VDSL interfaces on a VDSL board work in ATM mode.

Example

Enter the view of VDSL interface 1/0/0 working in ATM mode.

```
<Huawei> system-view
[Huawei] set workmode slot 1 vdsl atm
Warning: Changing the working mode will reset the board in slot 1. Continue? [y/
n]:y
INFO: Resetting board[1] succeeded.
[Huawei] interface atm 1/0/0
[Huawei-Atm1/0/0]
```

Related Topics

5.16.15 set workmode vdsl

5.16.13 interface ethernet (vdsl)

Function

The **interface ethernet** command displays the view of a VDSL interface working in PTM mode.

Format

interface ethernet *interface-number*

Parameters

Parameter	Description	Value
interface-number	Specifies the number of a VDSL interface working in PTM mode.	-

Views

System view

Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The **interface ethernet** command displays the view of a VDSL interface working in PTM mode.

Prerequisites

The VDSL interface has been configured to work in PTM mode by using the **5.16.15 set workmode vdsl** command.

By default, VDSL interfaces on a VDSL board work in PTM mode.

Example

Enter the view of VDSL interface 1/0/0 working in PTM mode.

```
<Huawei> system-view
[Huawei] set workmode slot 1 vdsl ptm
Warning: Changing the working mode will reset the board in slot 1. Continue? [y/
n]:y
INFO: Resetting board[1] succeeded.
[Huawei] interface ethernet 1/0/0
[Huawei-Ethernet1/0/0]
```

Related Topics

5.16.15 set workmode vdsl

5.16.14 mtu (vdsl)

Function

The **mtu** command sets the maximum transmission unit (MTU) for a VDSL interface.

The **undo mtu** command restores the default MTU.

By default, the MTU of a VDSL interface is 1500 bytes.

Format

mtu *mtu*

undo mtu

 Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
mtu	Specifies the MTU of a VDSL interface.	The value is an integer, in bytes. The value depends on the device.

Views

VDSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The size of data frames is limited at the network layer. Any time the IP layer receives an IP packet, it checks to which local interface the packet needs to be sent and obtains the MTU configured on the interface. Then the IP layer compares the MTU with the packet length. If the packet length is longer than the MTU, the IP layer fragments the packet into smaller packets, which are shorter than the MTU.

If forcible unfragmentation is configured, some packets may be discarded during data transmission at the IP layer. Therefore, large packets must be forcibly fragmented to prevent packet loss on the network. In this case, you can run the **mtu** command to set the size of a fragment.

Follow-up Procedure

Run the **shutdown** and **undo shutdown** commands to restart the related physical interface to make the configuration take effect.

Precautions

If you run the **mtu** command multiple times in the same VDSL interface view, only the latest configuration takes effect.

Example

Set the MTU of a VDSL interface to 1200 bytes.

```
<Huawei> system-view
[Huawei] interface atm 1/0/0
[Huawei-Atm1/0/0] mtu 1200
[Huawei-Atm1/0/0] shutdown
[Huawei-Atm1/0/0] undo shutdown
```

 Copyright © Huawei Technologies Co., Ltd.

5.16.15 set workmode vdsl

Function

The **set workmode vdsl** command configures the working mode for a VDSL interface.

By default, a VDSL interface works in PTM mode.

Format

set workmode slot *slot-id* **vdsl** { **atm** | **ptm** }

Parameters

Parameter	Description	Value
slot-id	Specifies the slot ID of the VDSL interface.	-
{ **atm** | **ptm** }	Specifies the working mode of the VDSL interface. • If **atm** is specified, the VDSL interface works in ATM mode. To transmit ATM cells on a VDSL interface, configure the interface to work in ATM mode. • If **ptm** is specified, the VDSL interface works in PTM mode. To transmit Ethernet frames on a VDSL interface, configure the interface to work in PTM mode.	-

Views

System view

Default Level

3: Management level

Usage Guidelines

Usage Scenario

The device aggregates service traffic to a DSLAM by using VDSL interfaces. To enable the device to transmit services on a VDSL line, run the **set workmode vdsl** command to configure the same working mode as the DSLAM for the device.

Follow-up Procedure

- Run the **interface atm** command to enter the interface view if the VDSL interface works in ATM mode.
- Run the **interface ethernet** command to enter the interface view if the VDSL interface works in PTM mode.

Precautions

Copyright © Huawei Technologies Co., Ltd.

After running the **set workmode vdsl** command, you need to restart the card or device (except the AR129CGVW-L and AR169FGW-L) and wait for a period of time to make the configuration take effect.

The AR129CGVW-L and AR169FGW-L support mode switching only when the interfaces are not configured and in the shutdown state.

ni

Example

Set the working mode to PTM for the VDSL interface in slot 1.

```
<Huawei> system-view
[Huawei] set workmode slot 1 vdsl ptm
Warning: Changing the working mode will reset the board in slot 1. Continue? [y/
n]:y
INFO: Resetting board[1] succeeded.
```

5.16.16 shutdown (vdsl)

Function

The **shutdown** command deactivates a VDSL interface.

The **undo shutdown** command activates a VDSL interface.

By default, a VDSL interface is activated.

Format

shutdown

undo shutdown

Parameters

None

Views

VDSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

VDSL interfaces must be activated before transmitting services. Activation of a VDSL interface refers to the training between a DSLAM and a CPE. During the training, the two devices check the line distance and status based on parameters such as the transmission standard, upstream and downstream line rates, and specified noise margin to determine whether they can work properly under the existing conditions. If the training succeeds, the VDSL interface on the CPE is activated and can transmit services between the two devices.

 Copyright © Huawei Technologies Co., Ltd.

The device functions as a CPE and aggregates services to a DSLAM by using a VDSL interface.

After the device starts, its VDSL interface is automatically activated. The VDSL interface remains activated as long as its VDSL line works properly. To enable the device to communicate with a DSLAM, run the **shutdown** command to deactivate the VDSL interface on the device, set parameters for the interface, and then reactivate this interface to make configurations take effect.

Follow-up Procedure

After a VDSL interface is deactivated, it is disconnected from a DSLAM. To enable the VDSL interface to transmit services, reactivate this VDSL interface.

Example

Activate VDSL interface 1/0/0.

```
<Huawei> system-view
[Huawei] interface atm 1/0/0
[Huawei-Atm1/0/0] undo shutdown
```

Related Topics

5.16.12 interface atm (vdsl)

5.16.17 vdsl anti-noise enable

Function

The **vdsl anti-noise enable** command enables enhanced noise resistance on a VDSL interface.

The **undo vdsl anti-noise enable** command disables enhanced noise resistance on a VDSL interface.

By default, enhanced noise resistance is disabled on a VDSL interface.

NOTE

Only the AR109, AR109W, AR109GW-L, AR129, AR129CVW, AR129CV, AR129GW-L, AR129CGVW-L, AR169, AR169CVW, AR169CVW-4B4S, AR169G-L, AR169W-P-M9, AR169RW-P-M9, and AR169-P-M9 devices support this configuration.

Format

vdsl anti-noise enable

undo vdsl anti-noise enable

Parameters

None

Views

VDSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

When a device functions as a CPE, enhanced noise resistance is disabled on the VDSL interface by default. High line noise will cause packet loss and line disconnection on the device. To avoid such issues, you can run the **vdsl anti-noise enable** command to enable enhanced noise resistance on the VDSL interface.

Precautions

This command will cause an interface to restart, resulting in data frame loss or service interruption.

After enhanced noise resistance is enabled, the negotiated VDSL link bandwidth may reduce. Therefore, configure this command based on the actual link effect.

Example

Enable enhanced noise resistance on a VDSL interface.

```
<Huawei> system-view
[Huawei] interface ethernet 0/0/0
[Huawei-Ethernet0/0/0] vdsl anti-noise enable
Warning: This operation may cause the interface to restart and work in lower bandwidth than befor. Are you sure to continue? [Y/N]:y
```

5.16.18 vdsl band

Function

The **vdsl band** command enables or disables a specified carrier band on a VDSL interface.

By default, carrier bands are enabled on a VDSL interface.

Format

vdsl band { **a43** | **b43** | **v43** } { **off** | **on** }

Parameters

Parameter	Description	Value
a43	Specifies the a43 carrier band on a VDSL interface.	-
b43	Specifies the b43 carrier band on a VDSL interface.	-
v43	Specifies the v43 carrier band on a VDSL interface.	-

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
off	Disables a specified carrier band on a VDSL interface.	-
on	Enables a specified carrier band on a VDSL interface.	-

Views

VDSL interface view, Ethernet interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Carrier bands a43, b43, and v43 on a VDSL interface allow the local device to connect to and negotiate with a digital subscriber line access multiplexer (DSLAM). By default, carrier bands are enabled on the VDSL interface and the local device selects a carrier band through auto-negotiation with the DSLAM. If the DSLAM does not support a carrier band, run the **vdsl band** { **a43** | **b43** | **v43** } **off** command to disable the carrier band.

Prerequisites

- The transmission mode has been set to ATM or PTM using the **set workmode** command on the VDSL interface.
- The VDSL interface has been deactivated using the **shutdown** command.

Precautions

The **vdsl band** command only enables or disables a specified carrier band on a VDSL interface. To make the configuration take effect immediately, run the **undo shutdown** command on the VDSL interface to activate the interface.

Example

Disable the v43 carrier band on the VDSL interface Ethernet0/0/0.

```
<Huawei> system-view
[Huawei] interface ethernet0/0/0
[Huawei-Ethernet0/0/0] shutdown
[Huawei-Ethernet0/0/0] vdsl band v43 off
[Huawei-Ethernet0/0/0] undo shutdown
```

Related Topics

5.16.16 shutdown (vdsl)

Copyright © Huawei Technologies Co., Ltd.

5.16.19 vdsl bind

Function

The **vdsl bind** command binds two lines of a VDSL interface in PTM mode.

The **undo vdsl bind** command unbinds two lines of a VDSL interface in PTM mode.

By default, two lines of a VDSL interface in PTM mode are bound.

NOTE

Only the 2VDSL2 interface card, AR169EW, AR169EGW-L, AR169F, AR169FVW, AR169FVW-8S, AR169FGW-L, and AR169FGVW-L support this command.

Format

vdsl bind

undo vdsl bind

Parameters

None

Views

VDSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

When the device is deployed as a CPE, a VDSL interface in PTM mode has two lines (Line0 and Line1). By default, the two lines are bound to increase bandwidth. When the DSLAM requires the CPE to use one line for access, run the **undo vdsl bind** command to unbind the two lines of the VDSL interface in PTM mode.

Prerequisites

1. The VDSL interface has been configured to work in PTM mode using the **set workmode slot** *slot-id* **vdsl ptm** command.
2. The VDSL interface has been deactivated using the **shutdown** command.

Follow-up Procedures

To make the configuration take effect immediately, run the **undo shutdown** command on the VDSL interface to activate the interface.

Example

Unbind two lines of a VDSL interface in PTM mode.

 Copyright © Huawei Technologies Co., Ltd.

```
<Huawei> system-view
[Huawei] interface ethernet 0/0/0
[Huawei-Ethernet0/0/0] undo vdsl bind
```

5.16.20 vdsl downstream-retrans enable

Function

The **vdsl downstream-retrans enable** command enables the downstream retransmission function on a VDSL interface.

The **undo vdsl downstream-retrans enable** command disables the downstream retransmission function on a VDSL interface.

By default, the downstream retransmission function is enabled on a VDSL interface.

NOTE

Only the AR109, AR109W, AR109GW-L, AR129, AR129CVW, AR129CV, AR129GW-L, AR129CGVW-L, AR169, AR169CVW, AR169CVW-4B4S, AR169G-L, AR169W-P-M9, AR169RW-P-M9, and AR169-P-M9 devices support this configuration.

Format

vdsl downstream-retrans enable

undo vdsl downstream-retrans enable

Parameters

None

Views

VDSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

When a device functions as a CPE, the downstream retransmission function is enabled on the VDSL interface by default. This enhances link reliability. When the device restarts, it sends a Dying Gasp message to the remote device. If the remote device that does not support the downstream retransmission function receives a Dying Gasp message, you can run the **undo vdsl downstream-retrans enable** command to disable the downstream retransmission function on the VDSL interface. In this case, the remote device can properly respond the Dying Gasp message.

Precautions

 Copyright © Huawei Technologies Co., Ltd.

This command will cause an interface to restart, resulting in data frame loss or service interruption.

Example

Disable the downstream retransmission function on a VDSL interface.

```
<Huawei> system-view
[Huawei] interface ethernet 0/0/0
[Huawei-Ethernet0/0/0] undo vdsl downstream-retrans enable
Warning: This operation may cause the interface to restart. Are you sure to continue? [Y/N]:y
```

5.16.21 vdsl upstream-retrans enable

Function

The **vdsl upstream-retrans enable** command enables the upstream retransmission function on a VDSL interface.

The **undo vdsl upstream-retrans enable** command disables the upstream retransmission function on a VDSL interface.

By default, the upstream retransmission function is enabled on a VDSL interface.

NOTE

Only the AR109, AR109W, AR109GW-L, AR129, AR129CVW, AR129CV, AR129GW-L, AR129CGVW-L, AR169, AR169CVW, AR169CVW-4B4S, AR169G-L, AR169W-P-M9, AR169RW-P-M9, and AR169-P-M9 devices support this configuration.

Format

vdsl upstream-retrans enable

undo vdsl upstream-retrans enable

Parameters

None

Views

VDSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

When a device functions as a CPE, the upstream retransmission function is enabled on the VDSL interface by default. This enhances link reliability. When the device restarts, it sends a Dying Gasp message to the remote device. If the remote device that does not support the upstream retransmission function receives a Dying Gasp message, you can run the **undo vdsl upstream-retrans enable**

 Copyright © Huawei Technologies Co., Ltd.

command to disable the upstream retransmission function on the VDSL interface. In this case, the remote device can properly respond the Dying Gasp message.

Precautions

This command will cause an interface to restart, resulting in data frame loss or service interruption.

Example

Disable the upstream retransmission function on a VDSL interface.

```
<Huawei> system-view
[Huawei] interface ethernet 0/0/0
[Huawei-Ethernet0/0/0] undo vdsl upstream-retrans enable
Warning: This operation may cause the interface to restart. Are you sure to continue? [Y/N]:y
```

5.16.22 vdsl standard

Function

The **vdsl standard** command configures a transmission standard for a VDSL interface in PTM mode.

The **undo vdsl standard** command restores the default setting.

By default, a VDSL interface in PTM mode automatically uses the transmission standard of the peer interface.

Format

vdsl standard vdsl2 { **annexa** | **annexb** }

undo vdsl standard

Parameters

Parameter	Description	Value
vdsl2	Configures VDSL2 (G993.2) for a VDSL interface in PTM mode. VDSL2 provides a maximum of 50 Mbit/s upstream transmission rate and 100 Mbit/s downstream transmission rate.	-
annexa	Supports VDSL2 and is compatible with POTS services.	-
annexb	Supports VDSL2 and is compatible with ISDN services.	-

Views

VDSL interface view

Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

To enable the device to transmit services on a VDSL line, run the **vdsl standard** command to configure the device to use the same transmission standard as a DSLAM.

Precautions

AR109, AR109W, AR109GW-L, AR129, AR129CVW, AR129CV, AR129GW-L, AR129CGVW-L, AR129W, AR169, AR169CVW, AR169CVW-4B4S, AR169G-L, AR169-P-M9, AR169W-P-M9, and AR169RW-P-M9 do not support T1.413.AR169EW, AR169EGW-L, AR169F, AR169BF, AR169FVW, AR169FVW-8S, AR169FGW-L, AR169JFVW-4B4S, AR169JFVW-2S, and AR169FGVW-L only support AnnexA and AnnexM. AR169BF only supports AnnexB and AnnexJ.

Prerequisites

The VDSL interface has been deactivated using the **shutdown** command.

Follow-up Procedure

To make the transmission standard configured for a VDSL interface take effect, run the **undo shutdown** command on the interface to activate the interface.

Example

Configure AnnexA for VDSL interface Eth0/0/0.

```
<Huawei> system-view
[Huawei] set workmode slot 0 vdsl ptm
Warning: All the configuration will be saved to the next startup configuration.
Continue? [y/n]: y
  It will take several minutes to save configuration file, please wait.....
...
  Configuration file had been saved successfully
  Note: The configuration file will take effect after being activated
Warning: Changing the working mode will reset the board in slot 0. Continue? [y/
n]:y
INFO: Resetting board[0] succeeded.
[Huawei] interface ethernet 0/0/0
[Huawei-Ethernet0/0/0] shutdown
[Huawei-Ethernet0/0/0] vdsl standard vdsl2 annexa
[Huawei-Ethernet0/0/0] undo shutdown
```

Related Topics

5.16.13 interface ethernet (vdsl)

5.16.16 shutdown (vdsl)

Copyright © Huawei Technologies Co., Ltd.

5.17 G.SHDSL Interface Configuration Commands

5.17.1 display dsl all interface

Function

The **display dsl all interface** command displays status information about all xDSL interfaces.

Format

display dsl all interface

Parameters

None

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

Usage Scenario

You can run the **display dsl all interface** command to check the negotiation status with xDSL interfaces at the central office, transmission standard, line status, performance statistics, bit exchange status, seamless rate adaptation status, trellis coding status, and card version of the ADSL interface and VDSL interface (in ATM or PTM mode), and check the link status, vendor, and performance statistics of the G.SHDSL interface.

Precautions

This command cannot display information about xDSL sub-interfaces.

Example

Display status information about all xDSL interfaces.

```
<Huawei> display dsl all interface
 Atm1/0/0 information:
 ------------------------------------------------------------
 DSL driver and PHY status
     Line0:
     Training status                  : Showtime
     Transmission mode                    : VDSL2
     VDSL2 profile                    : Profile 17a
     Line status                    : No Defect
     Downstream max. attainable rate(Kbps): 142372
     Upstream max. attainable rate(Kbps)  : 63853
```


Copyright © Huawei Technologies Co., Ltd.

```
    Downstream actual net data rate(Kbps): 60016
    Upstream actual net data rate(Kbps)  : 20013
    Downstream SNR margin(dB)            : 28.8
    Upstream SNR margin(dB)              : 31.9
    Downstream attenuation(dB)           : 0.0
    Upstream attenuation(dB)             : 0.0
    Downstream output power(dBm)         : 14.5
    Upstream output power(dBm)           : -6.4
    Downstream total cells               : 1348781845
    Upstream total cells                 : 0
    Downstream data cells                : 0
    Upstream data cells                  : 0
    Downstream bit errors                : 0
    Upstream bit errors                  : 0
    Total drop cells                     : 0
    Downstream total ES count            : 60
    Upstream total ES count              : 0
    Downstream total SES count           : 59
    Upstream total SES count             : 0
    Downstream total UAS count           : 849
    Upstream total UAS count             : 849
    Total AS count                       : 86128

    Line1:
    Training status                      : Showtime
    Transmission mode                    : VDSL2
    VDSL2 profile                        : Profile 17a
    Line status                          : No Defect
    Downstream max. attainable rate(Kbps): 145984
    Upstream max. attainable rate(Kbps)  : 64009
    Downstream actual net data rate(Kbps): 60016
    Upstream actual net data rate(Kbps)  : 20013
    Downstream SNR margin(dB)            : 28.0
    Upstream SNR margin(dB)              : 32.4
    Downstream attenuation(dB)           : 0.0
    Upstream attenuation(dB)             : 0.0
    Downstream output power(dBm)         : 13.1
    Upstream output power(dBm)           : -6.5
    Downstream total cells               : 1360438742
    Upstream total cells                 : 0
    Downstream data cells                : 0
    Upstream data cells                  : 0
    Downstream bit errors                : 0
    Upstream bit errors                  : 0
    Total drop cells                     : 0
    Downstream total ES count            : 59
    Upstream total ES count              : 0
    Downstream total SES count           : 56
    Upstream total SES count             : 0
    Downstream total UAS count           : 683
    Upstream total UAS count             : 683
    Total AS count                       : 86230

Line capability
    Bitswap                              : On
    SRA                                  : Off
    Trellis coding                       : On

Board version
    vendor ID                            : 0xB5 0 "BDCM" 0 0
    vendor serial                        : 10000000000000000000000000000000
    Board ID                             : 963168MBV_17A
    Software version                     : 4.12L.08
    Bootloader (CFE) version             : 1.0.38-112.118
    DSL PHY and driver version           : A2pvbF038j.d24h
    Build timestamp                      : 20170706_1814

ATU-C version
    vendor ID                            : BDCM:0x938f
```

```
    vendor number                    : 0x938f
-------------------------------------------------------------
Atm2/0/1 information:
-------------------------------------------------------------------
 Operating mode                        :CPE
 Port admin status                     :Active
 Port running status                   :Activated
 Port admin bind status                  :EFM-2
 Bind group master port                  :0
 Bind group running port                 :1;
 LOSWS Defect alarm                      :none
 SNR Margin alarm                      :none
 Loop Attenuation alarm                  :none
 Modem status                        :DOWN_READY
 Condition                         :NO_COND_
 Reason                            :ERR_UNUSED_
 Port transmission mode                  :G.991.2 Annex A&B&F&G
 Port power spectral density             :Symmetric
 Port line probe                    :Enable
 Inventory of SHDSL port 0
 Vendor ID                          :Infineon
 Vendor mode                          :SOCRATES
 Vendor serial                      :4e_2e_1e
 EOC version                        :0
 Standard version                     :8
 Vendor list                       :-
 Vendor issue                       :1
 Software code                        :1.7.2
 Equipment code                         :-
 Information of other vendor              :V200R008
 Transmission mode capability             :G.991.2 Annex A&B&F&G
-------------------------------------------------------------
```

Table 5-59 Description of the **display dsl all interface** command output

Item	Description
Atm1/0/0 information	Information about ATM1/0/0. ATM1/0/0 in this example is a VDSL interface. For detailed command output descriptions, see **display dsl interface atm (vdsl)** and **display dsl interface ethernet (vdsl)**. For detailed command output description of an ADSL interface, see **display dsl interface atm (adsl)**.
Atm2/0/1 information	Information about ATM2/0/1. ATM2/0/1 in this example is a G.SHDSL interface. For detailed command output description, see **display dsl interface (g.shdsl)**.

5.17.2 display dsl interface (g.shdsl)

Function

The **display dsl interface** command displays information about a G.SHDSL interface.

Format

display dsl interface { **atm** | **ethernet** } *interface-number*

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
atm	Displays information about a G.SHDSL interface working in ATM transmission mode.	-
ethernet	Displays information about a G.SHDSL interface working in PTM transmission mode.	-
interface-number	Specifies the number of a G.SHDSL interface.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

The **display dsl interface** command displays information about a G.SHDSL interface, including the link layer status, vendor information, and performance statistics.

NOTE

The fields displayed in the command output are the same for G.SHDSL interfaces working in ATM or PTM transmission mode.

Example

Display information about G.SHDSL interface 1/0/0 working in ATM transmission mode.

```
<Huawei> display dsl interface atm 1/0/0
-------------------------------------------------------------------------
  Operating mode                      :CPE
  Port admin status                   :Active
  Port running status                 :Activated
  Port admin bind status              :MPair-2
  Bind group master port              :0
  LOSWS Defect alarm                  :none
  SNR Margin alarm                    :none
  Loop Attenuation alarm              :none
  Modem status                        :UP_DATA_MODE
  Condition                           :GHS_TRANSFER_
  Reason                              :ERR_UNUSED_
  Port transmission mode              :G.991.2 Annex A&B&F&G
  Port power spectral density         :Symmetric
  Port line probe                     :Enable
```

 Copyright © Huawei Technologies Co., Ltd.

```
Line Status of SHDSL port 0
Current line rate(unit:kbps)                  :5704
Current transmission mode                     :G.991.2 Annex G
Actual attainable payload line rate(unit:kbps)  :11392
Current modulation mode                       :TCPAM-32
Current PBO downstream(unit:dB)               :6.0
Current PBO upstream(unit:dB)                 :0.0
Current loop attenuation downstream(unit:dB)    :0
Current loop attenuation upstream(unit:dB)      :0
Current SNR margin downstream(unit:dB)          :19
Current SNR margin upstream(unit:dB)            :0
Inventory of SHDSL port 0
Vendor ID                                     :Infineon
Vendor mode                                   :SOCRATES
Vendor serial                                 :4e_2e_1e
EOC version                                   :0
Standard version                              :8
Vendor list                                   :-
Vendor issue                                  :1
Software code                                 :1.6.3
Equipment code                                :-
Information of other vendor                   :B01D01
Transmission mode capability                  :G.991.2 Annex A&B&F&G
Current 15 minute statistics (Time elapsed 260 seconds)
 ES:0, SES:0, CRC:0, LOSWS:0, UAS:0
Previous 15 minute statistics
 ES:0, SES:0, CRC:0, LOSWS:0, UAS:0
Current 24 hr statistics
 ES:0, SES:0, CRC:0, LOSWS:0, UAS:0
Previous 24 hr statistics
 ES:0, SES:0, CRC:0, LOSWS:0, UAS:1
--------------------------------------------------------------------------
```

Display information about G.SHDSL interface 1/0/0 working in PTM transmission mode.

```
<Huawei> display dsl interface ethernet 1/0/0
--------------------------------------------------------------------------
  Operating mode                              :CPE
  Port admin status                           :Active
  Port running status                         :Activated
  Port admin bind status                      :EFM-2
  Bind group master port                      :0
  Bind group running port                     :1;
  LOSWS Defect alarm                          :none
  SNR Margin alarm                            :none
  Loop Attenuation alarm                      :none
  Modem status                                :DOWN_READY
  Condition                                   :NO_COND_
  Reason                                      :ERR_UNUSED_
  Port transmission mode                      :G.991.2 Annex A&B&F&G
  Port power spectral density                 :Symmetric
  Port line probe                             :Enable
  Inventory of SHDSL port 0
  Vendor ID                                   :Infineon
  Vendor mode                                 :SOCRATES
  Vendor serial                               :4e_2e_1e
  EOC version                                 :0
  Standard version                            :8
  Vendor list                                 :-
  Vendor issue                                :1
  Software code                               :1.7.2
  Equipment code                              :-
  Information of other vendor                 :V200R008
  Transmission mode capability                :G.991.2 Annex A&B&F&G
--------------------------------------------------------------------------
```

 Copyright © Huawei Technologies Co., Ltd.

Table 5-60 Description of the display dsl interface atm 1/0/0 command output

Item	Description
Operating mode	Working mode of the G.SHDSL interface: • CO: Central Office. • CPE: Customer Premises Equipment.
Port admin status	Administrative status of the G.SHDSL interface: • Active: indicates that the interface is activated. • Deactive: indicates that the interface is deactivated.
Port running status	Running status of the G.SHDSL interface: • Activated: indicates that the interface has been activated. • Activating: indicates that the interface is being activated. • Deactivated: indicates that the interface has been deactivated. • Deactivating: indicates that the interface is being deactivated.
Port admin bind status	Interface binding mode: • Normal: indicates that the G.SHDSL interface is not bound to any other interface. • MPair-X: indicates M-Pair binding. X specifies the number of bound interfaces. • EFM-X: indicates EFM binding. X specifies the number of bound interfaces. To configure the interface binding mode, run the **shdsl bind** { **efm** | **m-pair** } *link-number* command.
Bind group master port	Number of the main interface. This field is displayed only when M-Pair binding or EFM binding is configured.
Bind group running port	Number of the slave interface activated in the bind group. This field is displayed only when a main interface configured with EFM binding is configured.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
LOSWS Defect alarm	Loss of signal (LOS) alarm.
SNR Margin alarm	SNR margin alarm.
Loop Attenuation alarm	Loop attenuation alarm.
Modem status	Link modulation status. • DOWN_NOT_READY • DOWN_READY • STOP_DOWN_READY • INITIALIZING • UP_DATA_MODE
Condition	Condition for the modulation status.
Reason	Reason for the modulation status.
Port transmission mode	Transmission standard: • G.991.2 Annex A&B • G.991.2 Annex A • G.991.2 Annex B To configure the transmission standard, run the **shdsl annex** { **a** | **all** | **b** } command.
Port power spectral density	Power spectral density (PSD) mode: • Asymmetric: indicates asymmetric PSD. • Symmetric: indicates symmetric PSD. To configure the PSD mode, run the **shdsl psd** { **asymmetry** | **symmetry** } command.
Port line probe	Line probing status: • Enable: indicates that the line probing function is enabled. • Disable: indicates that the line probing function is disabled. To configure the line probing function, run the **shdsl line-probing** { **disable** | **enable** } command.
Current line rate(unit:kbps)	Actual line rate, in kbit/s.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Current transmission mode	Current transmission mode. The device displays the actual transmission mode negotiated by the two ends based on the output of the **shdsl capability** { **auto** | **g-shdsl** | **g-shdsl.bis** } command. • If **g-shdsl** is specified, the device displays **Annex A** or **Annex B**. • If **g-shdsl.bis** is specified, the device displays **Annex F** or **Annex G**. • If **auto** is specified, the device displays the transmission mode obtained from the CO side when functioning as a CPE and displays **Annex F** or **Annex G** (the same as the g-shdsl.bis mode) when functioning as a CO.
Actual attainable payload line rate(unit:kbps)	Actual line payload rate, in kbit/s.
Current modulation mode	Current modulation mode: • TCPAM-16 • TCPAM-32
Current PBO downstream(unit:dB)	Current downstream power back-off, in dB.
Current PBO upstream(unit:dB)	Current upstream power back-off, in dB.
Current loop attenuation downstream(unit:dB)	Current downstream loop attenuation, in dB.
Current loop attenuation upstream(unit:dB)	Current upstream loop attenuation, in dB.
Current SNR margin downstream(unit:dB)	Current downstream SNR margin, in dB.
Current SNR margin upstream(unit:dB)	Current upstream SNR margin, in dB.
Vendor ID	ID of a vendor.
Vendor mode	Model of the vendor equipment.
Vendor serial	Serial number of the vendor equipment.
EOC version	Embedded operations channel (EOC) software version.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
Standard version	G.SHDSL standard version.
Vendor list	If the system displays "-", there is no vendor list.
Vendor issue	Vendor software issue.
Software code	Vendor software version.
Equipment code	Vendor equipment code.
Information of other vendor	Information about other vendors.
Transmission mode capability	Supported transmission standard.
Current 15 minute statistics	Statistics in the current 15 minutes.
Time elapsed 260 seconds	Total number of seconds in which errors are detected within 15 minutes.
ES	Number of errored seconds recorded within 15 minutes. An errored second is a second in which at least one CRC error occurs or at least one Loss of Sync Word (LOSW) is set to 1.
SES	Number of severely errored seconds recorded within 15 minutes. A severely errored second is a second in which at least 50 CRC errors occur or at least one LOSW is set to 1.
CRC	Number of CRC errors detected within 15 minutes.
LOSWS	Number of LOSW seconds recorded within 15 minutes.
UAS	Number of seconds in which a G.SHDSL line remains unavailable within 15 minutes. If 10 consecutive severely errored seconds are detected on a G.SHDSL line, the G.SHDSL line becomes unavailable.
Previous 15 minute statistics	Statistics in the previous 15 minutes.
Current 24 hr statistics	Statistics in the current 24 hours.
Previous 24 hr statistics	Statistics in the previous 24 hours.

Related Topics

5.17.5 interface atm (g.shdsl)
5.17.6 interface ethernet (g.shdsl)

 Copyright © Huawei Technologies Co., Ltd.

5.17.3 display interface atm (g.shdsl)

Function

The **display interface atm** command displays the configuration and status of a G.SHDSL interface working in ATM transmission mode.

Format

display interface atm *interface-number*

Parameters

Parameter	Description	Value
interface-number	Specifies the number of a G.SHDSL interface working in ATM transmission mode.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

Usage Scenario

When monitoring the interface status or locating faults on a G.SHDSL interface, run the **display interface atm** command on the interface. You can collect traffic statistics and locate faults on the interface according to the command output.

Prerequisites

The G.SHDSL interface is working in ATM transmission mode.

Example

Display the configuration and status of G.SHDSL interface 1/0/0 working in ATM transmission mode.

```
<Huawei> display interface atm 1/0/0
Atm1/0/0 current state : UP
Line protocol current state : UP
Last line protocol up time : 2012-12-31 17:46:13
Description:HUAWEI, AR Series, Atm1/0/0 Interface
Route Port,The Maximum Transmit Unit is 1500
Internet Address is 1.1.1.1/24
AAL enabled: AAL5, Maximum PVCs: 8
PVCs on main-interface: 8 (Total PVCs: 8)
Last physical up time   : 2012-12-31 17:46:13
```

 Copyright © Huawei Technologies Co., Ltd.

```
Last physical down time : 2012-12-31 17:43:48
Current system time: 2013-01-06 14:06:38

Port PHY type : G.SHDSL
Total seconds counted in 15 minutes             :400
ES count in 15 minutes (unit:Second)            :0
SES count in 15 minutes (unit:Second)           :0
CRC anomaly count in 15 minutes                 :0
LOSW count in 15 minutes (unit:Second)            :0
UAS count in 15 minutes (unit:Second)           :0

Last 300 seconds input rate 1059904 bits/sec, 1232 packets/sec
Last 300 seconds output rate 1016080 bits/sec, 1221 packets/sec

Input:  622961422 packets, 66968337586 bytes
        0 error, 0 discard, 0 crc
Output:  617299079 packets, 64198983080 bytes
         0 error, 0 discard
    Input bandwidth utilization  :    0%
    Output bandwidth utilization :    0%
```

Table 5-61 Description of the display interface atm command output

Item	Description
Atm1/0/0 current state	Physical status of ATM1/0/0: • UP: indicates that the interface is physically Up. • DOWN: indicates that the interface is physically Down. • Administratively down: indicates that the network administrator has run the **shutdown** command on the interface.
Line protocol current state	Link layer protocol status of the interface: • UP: indicates that the link layer protocol status of the interface is Up. • DOWN: indicates that the link layer protocol status of the interface is Down or no IP address is assigned to the interface.
Last line protocol up time	Last time the link layer protocol of the interface goes Up.
Description	Interface description.
The Maximum Transmit Unit is	Maximum transmit unit (MTU) of the interface. By default, the MTU is 1500 bytes. Packets whose size is greater than the MTU are fragmented before being transmitted. If non-fragmentation is configured, these packets are discarded.
Internet Address is	IP address of the interface. If no IP address is assigned to the interface, the system displays "Internet protocol processing : disabled".
AAL enabled	ATM Adaptation Layer (AAL).

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Maximum PVCs	Maximum number of virtual circuits (PVCs).
PVCs on main-interface: (Total PVCs:)	Number of PVCs on the main interface (total number of PVCs on both the main interface and sub-interfaces).
Last physical up time	Last time the interface went Up physically. If the system displays "-", the physical status of the interface does not change. If the time zone is configured and the daylight saving time is used, the time is in YYYY/MM/DD HH:MM:SS UTC±HH:MM DST format.
Last physical down time	Last time the interface went Down physically. If the system displays "-", the physical status of the interface does not change. If the time zone is configured and the daylight saving time is used, the time is in YYYY/MM/DD HH:MM:SS UTC±HH:MM DST format.
Current system time	Current system time. If the time zone is configured and the daylight saving time is used, the time is in YYYY/MM/DD HH:MM:SS UTC±HH:MM DST format.
Port PHY type	Physical port type.
Total seconds counted in 15 minutes	Total number of seconds in which errors are detected within 15 minutes.
ES count in 15 minutes (unit:Second)	Number of errored seconds recorded within 15 minutes. An errored second is a second in which at least one CRC error occurs or at least one LOSW is set to 1.
SES count in 15 minutes (unit:Second)	Number of severely errored seconds recorded within 15 minutes. A severely errored second is a second in which at least 50 CRC errors occur or at least one LOSW is set to 1.
CRC anomaly count in 15 minutes	Number of CRC errors detected within 15 minutes.
LOSW count in 15 minutes (unit:Second)	Number of LOSW seconds recorded within 15 minutes.
UAS count in 15 minutes (unit:Second)	Number of seconds in which a G.SHDSL line remains unavailable within 15 minutes. If 10 consecutive severely errored seconds are detected on a G.SHDSL line, the G.SHDSL line becomes unavailable.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Last 300 seconds input rate	Incoming packet rate (bit/s and pps) within the last 300 seconds.
Last 300 seconds output rate	Outgoing packet rate (bit/s and pps) within the last 300 seconds.
Input	Total number of received packets.
Output	Total number of sent packets.
Input bandwidth utilization	Percentage of the incoming packet rate to the total bandwidth.
Output bandwidth utilization	Percentage of the outgoing packet rate to the total bandwidth.

Related Topics

5.17.5 interface atm (g.shdsl)

5.17.4 display interface ethernet (g.shdsl)

Function

The **display interface ethernet** command displays the configuration and status of a G.SHDSL interface working in PTM transmission mode.

Format

display interface ethernet *interface-number*

Parameters

Parameter	Description	Value
interface-number	Specifies the number of a G.SHDSL interface working in PTM transmission mode.	-

Views

All views

Default Level

1: Monitoring level

Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

Usage Scenario

When monitoring the interface status or locating faults on a G.SHDSL interface, run the **display interface ethernet** command on the interface. You can collect traffic statistics and locate faults on the interface according to the command output.

Prerequisites

The G.SHDSL interface is working in PTM transmission mode.

Example

Display the configuration and status of G.SHDSL interface 1/0/0 working in PTM transmission mode.

```
<Huawei> display interface ethernet 1/0/0
Ethernet1/0/0 current state : UP
Line protocol current state : UP
Description:HUAWEI, AR Series, Ethernet1/0/0 Interface
Route Port,The Maximum Transmit Unit is 1500
Internet protocol processing : 10.1.1.2/24
IP Sending Frames' Format is PKTFMT_ETHNT_2, Hardware address is 00e0-fc01-0003
Last physical up time   : 2010-06-21 14:56:32
Last physical down time : 2010-06-21 14:56:31
Current system time: 2010-06-29 20:26:18

  Port PHY type : G.SHDSL
  Total seconds counted in 15 minutes            :286
  ES count in 15 minutes (unit:Second)           :0
  SES count in 15 minutes (unit:Second)          :0
  CRC anomaly count in 15 minutes                :0
  LOSW count in 15 minutes (unit:Second)           :0
  UAS count in 15 minutes (unit:Second)          :286

  Last 300 seconds input rate 24 bits/sec, 0 packets/sec
  Last 300 seconds output rate 24 bits/sec, 0 packets/sec

  Input:  13 packets, 1160 bytes
          0 error, 0 discard,
  Output:  10 packets, 980 bytes
          0 error, 0 discard

    Input bandwidth utilization  : 0.01%
    Output bandwidth utilization : 0.01%
```

Table 5-62 Description of the display interface ethernet command output

Item	Description
Ethernet1/0/0 current state	Physical status of Ethernet1/0/0: • UP: indicates that the interface is physically Up. • DOWN: indicates that the interface is physically Down. • Administratively down: indicates that the network administrator has run the **shutdown** command on the interface.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Line protocol current state	Link layer protocol status of the interface: • UP: indicates that the link layer protocol status of the interface is Up. • DOWN: indicates that the link layer protocol status of the interface is Down or no IP address is assigned to the interface.
Description	Interface description.
Internet protocol processing : disabled	No IP address is assigned to the interface. If an IP address is assigned to the interface, the IP address and subnet mask are displayed.
IP Sending Frames' Format is	Format of the frame contained in the sent IP packet.
Last physical up time	Last time the interface went Up physically. If the system displays "-", the physical status of the interface does not change. If the time zone is configured and the daylight saving time is used, the time is in YYYY/MM/DD HH:MM:SS UTC±HH:MM DST format.
Last physical down time	Last time the interface went Down physically. If the system displays "-", the physical status of the interface does not change. If the time zone is configured and the daylight saving time is used, the time is in YYYY/MM/DD HH:MM:SS UTC±HH:MM DST format.
Current system time	Current system time. If the time zone is configured and the daylight saving time is used, the time is in YYYY/MM/DD HH:MM:SS UTC±HH:MM DST format.
Port PHY type	Physical port type.
Total seconds counted in 15 minutes	Total number of seconds in which errors are detected within 15 minutes.
ES count in 15 minutes (unit:Second)	Number of errored seconds recorded within 15 minutes. An errored second is a second in which at least one CRC error occurs or at least one LOSW is set to 1.
SES count in 15 minutes (unit:Second)	Number of severely errored seconds recorded within 15 minutes. A severely errored second is a second in which at least 50 CRC errors occur or at least one LOSW is set to 1.
CRC anomaly count in 15 minutes	Number of CRC errors detected within 15 minutes.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
LOSW count in 15 minutes (unit:Second)	Number of LOSW seconds recorded within 15 minutes.
UAS count in 15 minutes (unit:Second)	Number of seconds in which a G.SHDSL line remains unavailable within 15 minutes. If 10 consecutive severely errored seconds are detected on a G.SHDSL line, the G.SHDSL line becomes unavailable.
Input bandwidth utilization	Inbound bandwidth usage.
Output bandwidth utilization	Outbound bandwidth usage.

Related Topics

5.17.6 interface ethernet (g.shdsl)

5.17.5 interface atm (g.shdsl)

Function

The **interface atm** command displays the view of a G.SHDSL interface working in ATM transmission mode.

Format

interface atm *interface-number*

Parameters

Parameter	Description	Value
interface-number	Specifies the number of a G.SHDSL interface working in ATM transmission mode.	-

Views

System view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Copyright © Huawei Technologies Co., Ltd.

The **interface atm** command displays the view of a G.SHDSL interface working in ATM transmission mode.

Prerequisites

The G.SHDSL interface has been configured to work in ATM mode by using the **set workmode (shdsl)** command.

Example

Enter the view of G.SHDSL interface 1/0/0 working in ATM transmission mode.

```
<Huawei> system-view
[Huawei] set workmode slot 1 shdsl atm
Warning: Changing the working mode will reset the board in slot 1. Continue? [y/
n]:y
INFO: Resetting board[1] succeeded.
[Huawei] interface atm 1/0/0
[Huawei-Atm1/0/0]
```

Related Topics

5.17.8 set workmode shdsl

5.17.6 interface ethernet (g.shdsl)

Function

The **interface ethernet** command displays the view of a G.SHDSL interface working in PTM transmission mode.

Format

interface ethernet *interface-number*

Parameters

Parameter	Description	Value
interface-number	Specifies the number of a G.SHDSL interface working in PTM transmission mode.	-

Views

System view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

 Copyright © Huawei Technologies Co., Ltd.

The **interface ethernet** command displays the view of a G.SHDSL interface working in PTM transmission mode.

Prerequisites

The G.SHDSL interface has been configured to work in PTM mode by using the **set workmode (shdsl)** command.

Example

Enter the view of G.SHDSL interface 1/0/0 working in PTM transmission mode.

```
<Huawei> system-view
[Huawei] set workmode slot 1 shdsl ptm
Warning: Changing the working mode will reset the board in slot 1. Continue? [y/
n]:y
INFO: Resetting board[1] succeeded.
[Huawei] interface ethernet 1/0/0
[Huawei-Ethernet1/0/0]
```

Related Topics

5.17.8 set workmode shdsl

5.17.7 mtu (g.shdsl)

Function

The **mtu** command sets the maximum transmission unit (MTU) for a G.SHDSL interface.

The **undo mtu** command restores the default MTU.

By default, the MTU of a G.SHDSL interface is 1500 bytes.

Format

mtu *mtu*

undo mtu

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
mtu	Specifies the MTU of a G.SHDSL interface.	The value is an integer, in bytes. If G.SHDSL interfaces work in ATM transmission mode, the value range is as follows: • AR100&AR120&AR150&AR160&AR200 series, AR1200 series, AR2220E and AR2204: 128 to 1606. • AR2220, AR2240, AR2240C, AR3260, and AR3670: 128 to 1978. If G.SHDSL interfaces work in PTM transmission mode, the value is ranging from 46 to 1572.

Views

G.SHDSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The size of data frames is limited at the network layer. Any time the IP layer receives an IP packet, it checks to which local interface the packet needs to be sent and obtains the MTU configured on the interface. Then the IP layer compares the MTU with the packet length. If the packet length is longer than the MTU, the IP layer fragments the packet into smaller packets, which are shorter than the MTU.

If forcible unfragmentation is configured, some packets may be discarded during data transmission at the IP layer. Therefore, large packets must be forcibly fragmented to prevent packet loss on the network. In this case, you can run the **mtu** command to set the size of a fragment.

Follow-up Procedure

 Copyright © Huawei Technologies Co., Ltd.

Run the **shutdown** and **undo shutdown** commands to restart the related physical interface to make the configuration take effect.

Precautions

If you run the **mtu** command multiple times in the same G.SHDSL interface view, only the latest configuration takes effect.

Example

Set the MTU of a G.SHDSL interface to 1200 bytes.

```
<Huawei> system-view
[Huawei] interface atm 1/0/0
[Huawei-Atm1/0/0] mtu 1200
[Huawei-Atm1/0/0] shutdown
[Huawei-Atm1/0/0] undo shutdown
```

5.17.8 set workmode shdsl

Function

The **set workmode shdsl** command sets the transmission mode for a G.SHDSL interface.

By default, G.SHDSL interfaces work in ATM mode.

Format

set workmode slot *slot-id* **shdsl** { **atm** | **ptm** }

Parameters

Parameter	Description	Value
slot *slot-id*	Specifies the slot ID of a G.SHDSL interface.	-
atm	Indicates a G.SHDSL interface works in ATM transmission mode. To transmit ATM cells on a G.SHDSL interface, configure the interface to work in ATM transmission mode.	-
ptm	Indicates a G.SHDSL interface works in PTM transmission mode. To transmit Ethernet frames on a G.SHDSL interface, configure the interface to work in PTM transmission mode.	-

Views

System view

Default Level

3: Management level

Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

Usage Scenario

The device aggregates service traffic to a DSLAM by using G.SHDSL interfaces. To enable the device to transmit services on a G.SHDSL line, run the **set workmode shdsl** command to configure the same transmission mode as the DSLAM for the device.

Prerequisites

All G.SHDSL interfaces have been deactivated and unbound from each other.

Follow-up Procedure

- Run the **interface atm** command to enter the interface view if the G.SHDSL interface works in ATM mode.
- Run the **interface ethernet** command to enter the interface view if the G.SHDSL interface works in PTM mode.

Precautions

- The SRU of AR158E, AR158EVW, AR168F, AR168F-4P and AR208E has only one WAN physical interface. After the transmission mode is set for the G.SHDSL interface card, four G.SHDSL interfaces all work in the configured mode. The AR168F and AR168F-4P interfaces are numbered from 0 to 3. In ATM mode, the AR158E, AR158EVW and AR208E interfaces are numbered from 0 to 3; in PTM mode, the AR158E and AR158EVW interfaces are numbered from 4 to 7, and AR208E interfaces are numbered from 8 to 11.
- Each 4G.SHDSL board on the AR1200, AR2204, AR2204-51GE-P, AR2204-51GE-R, AR2204-27GE-P, AR2204-27GE, AR2204E-D-27GE, AR2204E, AR2204E-D, AR2220E, AR2220, AR2240, AR2240C, AR3200, and AR3600 has only one physical interface. This physical interface can be virtualized into four G.SHDSL upstream interfaces numbered from 0 to 3. After the transmission mode is set for the G.SHDSL interface card, four G.SHDSL interfaces all work in the configured mode.

Example

Set the transmission mode to PTM for the G.SHDSL interface in slot 1.

```
<Huawei> system-view
[Huawei] set workmode slot 1 shdsl ptm
Warning: Changing the working mode will reset the board in slot 1. Continue? [y/
n]:y
INFO: Resetting board[1] succeeded.
```

5.17.9 shdsl annex

Function

The **shdsl annex** command configures a transmission standard for a G.SHDSL interface.

By default, a G.SHDSL interface supports G.991.2 Annex A, G.991.2 Annex F, and G.991.2 Annex B, and G.991.2 Annex G.

Copyright © Huawei Technologies Co., Ltd.

Format

shdsl annex { **a** | **all** | **b** }

Parameters

Parameter	Description	Value
a	Configures a G.SHDSL interface to support G.991.2 Annex A and G.991.2 Annex F. If **a** is specified: ● When payload rate on G.SHDSL interface channels is smaller than 2304 kbit/s, the router applies the G.991.2 Annex A standard on the interface. ● When payload rate on G.SHDSL interface channels between 2304 kbit/s and 5696 kbit/s, the router applies the G.991.2 Annex F standard on the interface.	-
all	Configures a G.SHDSL interface to support G.991.2 Annex A, G.991.2 Annex F, and G.991.2 Annex B, and G.991.2 Annex G. G.SHDSL interfaces on both ends negotiate the transmission standard.	-

 Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
b	Configures a G.SHDSL interface to support G.991.2 Annex B and G.991.2 Annex G. If **b** is specified: • When payload rate on G.SHDSL interface channels is smaller than 2304 kbit/s, the router applies the G.991.2 Annex B standard on the interface. • When payload rate on G.SHDSL interface channels between 2304 kbit/s and 5696 kbit/s, the router applies the G.991.2 Annex G standard on the interface.	-

Views

G.SHDSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

When the router works as customer premises equipment (CPE), it can adapt the transmission standard according to the standard used on the central office (CO). For example, if the CO uses the G.991.2 Annex B standard while the CPE uses another standard, the CPE automatically changes the standard to G.991.2 Annex B. To enable services to be transmitted on an SHDSL line, run the **shdsl annex** command to specify the same transmission standard as that used on the CO. The default configuration is recommended.

Prerequisites

The G.SHDSL interface has been deactivated using the **shutdown** command.

Precautions

The transmission standard can be configured on G.SHDSL interfaces working in ATM or PTM transmission mode. If the transmission mode is set to ATM and the

 Copyright © Huawei Technologies Co., Ltd.

interface binding mode is set to M-Pair binding, the transmission standard must be configured on the main interface.

Example

Set the transmission standard of G.SHDSL interface 1/0/0 working in PTM transmission mode to G.991.2 Annex A.

```
<Huawei> system-view
[Huawei] set workmode slot 1 shdsl ptm
Warning: Changing the working mode will reset the board in slot 1. Continue? [y/
n]:y
INFO: Resetting board[1] succeeded.
[Huawei] interface ethernet 1/0/0
[Huawei-Ethernet1/0/0] shutdown
[Huawei-Ethernet1/0/0] shdsl annex a
```

Related Topics

5.17.8 set workmode shdsl

5.17.10 shdsl bind

Function

The **shdsl bind** command binds a G.SHDSL interface.

The **undo shdsl bind** command unbinds a G.SHDSL interface.

By default, G.SHDSL interfaces are not bound together.

Format

shdsl bind { **efm** *link-number* | **m-pair** { *link-number* | **auto** } }

undo shdsl bind

Parameters

Parameter	Description	Value
efm	Sets the interface binding mode to EFM binding. When G.SHDSL interfaces work in PTM mode, they can be bound in EFM mode. In EFM binding mode, a maximum of four interfaces can be bound together. The rate after interface binding equals the sum of rates of all the bound interfaces.	-

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
m-pair	Sets the interface binding mode to M-Pair binding. When G.SHDSL interfaces work in ATM mode, they can be bound in M-Pair mode. In M-Pair binding mode, two G.SHDSL interfaces, three G.SHDSL interfaces, or four G.SHDSL interfaces can be bound together to provide twice, three times, or four times the rate of a single G.SHDSL interface.	-

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
link-number	Specifies the number of interfaces to be bound.	The value can be 2, 3, or 4. **NOTE** • The SRU of AR158E, AR158EVW, AR168F, AR168F-4P and AR208E has only one WAN physical interface. After the transmission mode is set for the G.SHDSL interface card, four G.SHDSL interfaces all work in the configured mode. The AR168F and AR168F-4P interfaces are numbered from 0 to 3. In ATM mode, the AR158E, AR158EVW and AR208E interfaces are numbered from 0 to 3; in PTM mode, the AR158E and AR158EVW interfaces are numbered from 4 to 7, and AR208E interfaces are numbered from 8 to 11. • Each 4G.SHDSL board on the AR1200, AR2204, AR2204-51GE-P, AR2204-51GE-R, AR2204-27GE-P, AR2204-27GE, AR2204E-D-27GE, AR2204E, AR2204E-D, AR2220E, AR2220, AR2240, AR2240C, AR3200, and AR3600 has only one physical interface. This physical interface can be virtualized into four G.SHDSL upstream interfaces numbered from 0 to 3. After the transmission mode is set for the G.SHDSL interface card, four G.SHDSL interfaces all work in the configured mode. • If the value is 2, two interfaces (Port 0 and Port 1, or Port 2 and Port 3) can be bound together.

 Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
		• If the value is 3, three interfaces (Port 0, Port 1, and Port 2) can be bound together. • If the value is 4, four interfaces (Port 0, Port 1, Port 2, and Port 3) can be bound together.
auto	Indicates the automatic binding mode. After this parameter is specified, the local device automatically adjusts its binding mode to be the same as the binding mode of the peer device through negotiation. **NOTE** • This parameter is configured only when the device functions as a CPE and the transmission mode is ATM.	-

Views

G.SHDSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

To increase link bandwidth, run the **shdsl bind** command to bind G.SHDSL interfaces.

Prerequisites

- Only contiguous interfaces on the same 4G.SHDSL board can be bound together. The number of the first interface to be bound must be 0 or 2, and the first bound interface is the main interface, and the remaining bound interfaces are slave interfaces.
- Before binding interfaces, ensure that these interfaces have been deactivated and that slave interfaces are not configured with any service.

 Copyright © Huawei Technologies Co., Ltd.

- You can run the **shdsl bind m-pair auto** command only when the G.SHDSL interface works in CPE mode and the transmission mode is ATM.

Precautions

- After G.SHDSL interfaces are bound together in M-Pair mode, the transmission standard, PSD mode, and line probing status of these interfaces are restored to the default settings. To activate all the bound interfaces or set parameters for these interfaces, you just need to activate the main interface or set parameters for the main interface. Other bound interfaces inherit the configurations from the main interface. For example, if the main interface is activated, other interfaces in the same binding group are also activated.
- After G.SHDSL interfaces are bound together in EFM mode, you can set different parameters for these interfaces. For example, you can set different transmission standards for these interfaces.

  NOTE

  To activate G.SHDSL interfaces bound in EFM mode, activate the main and slave interfaces in sequence.
- When G.SHDSL interfaces are bound together in EFM mode, these G.SHDSL interfaces cannot be bound to other interfaces. For example, when G.SHDSL interfaces 1/0/0 and 1/0/1 are bound in EFM mode, G.SHDSL interface 1/0/2 cannot be bound to G.SHDSL interface 1/0/0 or 1/0/1.

Example

Bind G.SHDSL interfaces 1/0/0, 1/0/1, and 1/0/2 working in PTM transmission mode in EFM mode.

```
<Huawei> system-view
[Huawei] set workmode slot 1 shdsl ptm
Warning: Changing the working mode will reset the board in slot 1. Continue? [y/
n]:y
INFO: Resetting board[1] succeeded.
[Huawei] interface ethernet 1/0/0
[Huawei-Ethernet1/0/0] shutdown
[Huawei-Ethernet1/0/0] quit
[Huawei] interface ethernet 1/0/1
[Huawei-Ethernet1/0/1] shutdown
[Huawei-Ethernet1/0/1] quit
[Huawei] interface ethernet 1/0/2
[Huawei-Ethernet1/0/2] shutdown
[Huawei-Ethernet1/0/2] quit
[Huawei] interface ethernet 1/0/0
[Huawei-Ethernet1/0/0] shdsl bind efm 3
```

Related Topics

5.17.8 set workmode shdsl

5.17.27 shutdown (g.shdsl)

5.17.11 shdsl bind m-pair 2 pairs

Function

The **shdsl bind m-pair 2 pairs** command configures a binding mode for a G.SHDSL interface.

The **undo shdsl bind** command unbinds a G.SHDSL interface.

 Copyright © Huawei Technologies Co., Ltd.

By default, the auto-enhanced binding mode is used.

Format

shdsl bind m-pair 2 [**pairs** { **auto-enhanced** | **enhanced** | **standard** }]

undo shdsl bind

Parameters

Parameter	Description	Value
auto-enhanced	Indicates the auto-enhanced mode.	-
enhanced	Indicates the enhanced mode.	-
standard	Indicates the standard mode.	-

Views

G.SHDSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

To enable the device to connect to the peer device, run the **shdsl bind m-pair 2 pairs** command to configure a binding mode based on the chip type of the peer device.

Prerequisites

- The G.SHDSL interface has been configured to work in ATM transmission mode.
- Only contiguous interfaces on the same 4G.SHDSL board can be bound together. The number of the first interface to be bound must be 0 or 2, and the first bound interface is the main interface, and the remaining bound interfaces are slave interfaces.
- Before binding interfaces, ensure that these interfaces have been deactivated and that slave interfaces are not configured with any service.

Precautions

- When the g-shdsl mode is configured, G.SHDSL interface supports only the enhanced mode.
- When the g-shdsl.bisl mode is configured, G.SHDSL interface supports auto-enhanced, standard, and enhanced modes. By default, when the g-shdsl.bisl mode is configured, G.SHDSL interface uses the auto-enhanced mode.

 Copyright © Huawei Technologies Co., Ltd.

- This command can only be executed on interface 0 or 2.

Example

Set the binding mode to enhanced.

```
<Huawei> system-view
[Huawei] set workmode slot 1 shdsl atm
Warning: Changing the working mode will reset the board in slot 1. Continue? [y/
n]:y
INFO: Resetting board[1] succeeded.
[Huawei] interface atm 1/0/0
[Huawei-Atm1/0/0] shutdown
[Huawei-Atm1/0/0] shdsl bind m-pair 2 pairs enhanced
[Huawei] interface atm 1/0/1
[Huawei-Atm1/0/1] shutdown
[Huawei-Atm1/0/1] quit
```

Related Topics

5.17.8 set workmode shdsl

5.17.27 shutdown (g.shdsl)

5.17.12 shdsl capability

Function

The **shdsl capability** command configures the capability for the G.SHDSL interface card.

The **undo shdsl capability** command restores the default setting.

By default, the G.SHDSL interface card uses the auto mode.

Format

shdsl capability { **auto** | **g-shdsl** | **g-shdsl.bis** }

undo shdsl capability

Parameters

Parameter	Description	Value
auto	Indicates the auto mode.	-
g-shdsl	Indicates the g-shdsl mode.	-
g-shdsl.bis	Indicates the g-shdsl.bis mode.	-

Views

G.SHDSL interface view

 Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

To enable the device to connect to the peer device, run the **shdsl capability** command to configure the capability for the G.SHDSL interface card based on the chip type of the peer device. When the peer device uses the g-shdsl mode, you must configure the g-shdsl mode on the device.

Prerequisites

The **shutdown** command has been executed on the G.SHDSL interface.

Precautions

If you run the **shdsl capability** command multiple times in the same G.SHDSL interface view, only the latest configuration takes effect.

Example

Configure the capability in g-shdsl mode for the G.SHDSL interface card working in ATM transmission mode.

```
<Huawei> system-view
[Huawei] set workmode slot 1 shdsl atm
Warning: Changing the working mode will reset the board in slot 1. Continue? [y/
n]:y
INFO: Resetting board[1] succeeded.
[Huawei] interface atm 1/0/0
[Huawei-Atm1/0/0] shutdown
[Huawei-Atm1/0/0] shdsl capability g-shdsl
```

Related Topics

5.17.8 set workmode shdsl

5.17.27 shutdown (g.shdsl)

5.17.13 shdsl compatibility

Function

The **shdsl compatibility** command sets the compatibility mode for a G.SHDSL interface.

The **undo shdsl compatibility** command restores the default setting.

By default, a G.SHDSL interface uses the **normal** compatibility mode.

Format

shdsl compatibility pmms { **normal** | **long** } **vendor** { **normal** | **gs** [**enhanced**] } **filter** { **normal** | **specific** }

undo shdsl compatibility

 Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
pmms { **normal** | **long** }	Specifies the probe mode of the G.SHDSL interface. • **normal** indicates the standard probe mode. • **long** indicates the probe mode that is compatible with the receiver equipped with Globespan chip 2.5.x or 3.0.x.	-
vendor { **normal** | **gs** [**enhanced**] }	Specifies the vendor ID of the G.SHDSL interface. • **normal** indicates the device vendor ID. • **gs** indicates Globespan vendor ID. **gs enhanced** indicates enhanced Globespan vendor ID. The peer device with Globespan vendor ID will disconnect from the router that has an ID different from Globespan vendor ID. To solve the problem, set the vendor ID to Globespan vendor ID. **NOTE** If the router configured with Globespan vendor ID cannot communicate with the peer device, configure enhanced Globespan vendor ID.	-
filter { **normal** | **specific** }	Specifies the interoperatability mode of the G.SHDSL interface. • **normal** indicates the default mode. • **specific** indicates the mode in which the device can identify signals sent by the peer device when the device connects to the peer device equipped with Globespan chip of earlier version and the rate is less than 512 kbit/s, and the power spectral density (PSD) mode does not comply with standards.	-

Views

G.SHDSL interface view

Default Level

2: Configuration level

 Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

Usage Scenario

To enable the device to connect to the peer device, run the **shdsl compatibility** command to configure the capability for the G.SHDSL interface based on the chip type of the peer device.

Prerequisites

The **shutdown** command has been executed on the G.SHDSL interface.

Example

Set the compatibility mode for ATM 1/0/0.

```
<Huawei> system-view
[Huawei] set workmode slot 1 shdsl atm
Warning: Changing the working mode will reset the board in slot 1. Continue? [y/
n]:y
INFO: Resetting board[1] succeeded.
[Huawei] interface atm 1/0/0
[Huawei-Atm1/0/0] shutdown
[Huawei-Atm1/0/0] shdsl compatibility pmms long vendor gs filter specific
```

Related Topics

5.17.8 set workmode shdsl

5.17.27 shutdown (g.shdsl)

5.17.14 shdsl current target snr margin downstream

Function

The **shdsl current target snr margin downstream** command sets the downlink signal to noise ratio (SNR) on a G.SHDSL interface.

The **undo shdsl current target snr margin downstream** command restores the default setting.

By default, the downlink SNR on a G.SHDSL interface is 6 dB.

Format

shdsl current target snr margin downstream *value*

undo shdsl current target snr margin downstream

Parameters

Parameter	Description	Value
value	Specifies the downlink SNR on a G.SHDSL interface.	The value is an integer that ranges from 0 to 10, in dB.

 Copyright © Huawei Technologies Co., Ltd.

Views

G.SHDSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

You can set the downlink SNR for a G.SHDSL interface to manage the device.

When the actual SNR of the device is greater than the configured SNR, the device is activated successfully.

Prerequisites

The **shutdown** command has been executed on the G.SHDSL interface.

Configuration Impact

If you run the **shdsl current target snr margin downstream** command multiple times in the same G.SHDSL interface view, only the latest configuration takes effect.

Example

Set the downlink SNR on a G.SHDSL interface to 4 dB.

```
<Huawei> system-view
[Huawei] set workmode slot 1 shdsl atm
Warning: Changing the working mode will reset the board in slot 1. Continue? [y/
n]:y
INFO: Resetting board[1] succeeded.
[Huawei] interface atm 1/0/0
[Huawei-Atm1/0/0] shutdown
[Huawei-Atm1/0/0] shdsl current target snr margin downstream 4
```

Related Topics

5.17.8 set workmode shdsl

5.17.27 shutdown (g.shdsl)

5.17.15 shdsl current target snr margin upstream

Function

The **shdsl current target snr margin upstream** command sets the uplink signal to noise ratio (SNR) on a G.SHDSL interface.

The **undo shdsl current target snr margin upstream** command restores the default setting.

By default, the uplink SNR on a G.SHDSL interface is 6 dB.

 Copyright © Huawei Technologies Co., Ltd.

Format

shdsl current target snr margin upstream *value*

undo shdsl current target snr margin upstream

Parameters

Parameter	Description	Value
value	Specifies the uplink SNR on a G.SHDSL interface.	The value is an integer that ranges from 0 to 10, in dB.

Views

G.SHDSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

You can set the uplink SNR for a G.SHDSL interface to manage the device.

When the actual SNR of the device is greater than the configured SNR, the device is activated successfully.

Prerequisites

The **shutdown** command has been executed on the G.SHDSL interface.

Configuration Impact

If you run the **shdsl current target snr margin upstream** command multiple times in the same G.SHDSL interface view, only the latest configuration takes effect.

Example

Set the uplink SNR on a G.SHDSL interface to 4 dB.

```
<Huawei> system-view
[Huawei] set workmode slot 1 shdsl atm
Warning: Changing the working mode will reset the board in slot 1. Continue? [y/
n]:y
INFO: Resetting board[1] succeeded.
[Huawei] interface atm 1/0/0
[Huawei-Atm1/0/0] shutdown
[Huawei-Atm1/0/0] shdsl current target snr margin upstream 4
```

Related Topics

5.17.8 set workmode shdsl

Copyright © Huawei Technologies Co., Ltd.

5.17.27 shutdown (g.shdsl)

5.17.16 shdsl line-probing

Function

The **shdsl line-probing** command enables or disables the line probing function on a G.SHDSL interface.

By default, the line probing function is enabled on a G.SHDSL interface.

Format

shdsl line-probing { **disable** | **enable** }

Parameters

Parameter	Description	Value
disable	Disables the line probing function on a G.SHDSL interface.	-
enable	Enables the line probing function on a G.SHDSL interface.	-

Views

G.SHDSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The **shdsl line-probing** command is used in the following scenarios:

- If the remote DSLAM is configured with the maximum and minimum G.SHDSL line rates, the local G.SHDSL interface must be activated at a rate within the specified range. By enabling the line probing function on the G.SHDSL interface, configure the G.SHDSL interface to be activated at the rate that is within the specified range and matches the actual line rate.
- If the remote DSLAM is configured with a fixed G.SHDSL line rate, the local G.SHDSL interface must be activated at the fixed G.SHDSL line rate. By disabling the line probing function on the G.SHDSL interface, enable the G.SHDSL interface to be activated at the fixed G.SHDSL line rate.

Prerequisites

The G.SHDSL interface has been deactivated using the **shutdown** command.

 Copyright © Huawei Technologies Co., Ltd.

Precautions

Enabling the line probing function prolongs interface activation, and disabling the line probing function shortens interface activation.

If a G.SHDSL interface fails to be activated, the maximum and minimum line rates need to be reconfigured on the remote DSLAM to ensure successful interface activation, regardless of whether the line probing function is enabled.

The line probing function can be enabled or disabled on G.SHDSL interfaces working in ATM or PTM transmission mode. If the transmission mode is set to ATM and the interface binding mode is set to M-Pair binding, the line probing function must be enabled or disabled on the main interface.

Example

Disable the line probing function on G.SHDSL interface 1/0/0 working in PTM transmission mode.

```
<Huawei> system-view
[Huawei] set workmode slot 1 shdsl ptm
Warning: Changing the working mode will reset the board in slot 1. Continue? [y/
n]:y
INFO: Resetting board[1] succeeded.
[Huawei] interface ethernet 1/0/0
[Huawei-Ethernet1/0/0] shutdown
[Huawei-Ethernet1/0/0] shdsl line-probing disable
```

Related Topics

5.17.8 set workmode shdsl

5.17.17 shdsl mode

Function

The **shdsl mode** command configures a working mode for a G.SHDSL interface.

The **undo shdsl mode** command restores the default working mode of a G.SHDSL interface.

By default, a G.SHDSL interface works in CPE mode.

Format

shdsl mode { **co** | **cpe** }

undo shdsl mode

Parameters

Parameter	Description	Value
co	Indicates that a G.SHDSL interface works in CO mode.	-
cpe	Indicates that a G.SHDSL interface works in CPE mode.	-

Copyright © Huawei Technologies Co., Ltd.

Views

G.SHDSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

When two devices establish a back-to-back connection, one device must work in CO mode and the other device must work in CPE mode.

Prerequisites

1. All the G.SHDSL interfaces on the same board (4G.SHDSL interface card or SRU) have been deactivated using the **shutdown** command.
2. All the G.SHDSL interfaces on the same board (4G.SHDSL interface card or SRU) are not bound together.

Precautions

This command can be configured only on the G.SHDSL interface with the smallest interface number among all the G.SHDSL interfaces on the same board (4G.SHDSL interface card or SRU).

Example

Configure the G.SHDSL interface using ATM to work in CO mode.

```
<Huawei> system-view
[Huawei] set workmode slot 1 shdsl atm
Warning: Changing the working mode will reset the board in slot 1. Continue? [y/
n]:y
INFO: Resetting board[1] succeeded.
[Huawei] interface atm 1/0/1
[Huawei-Atm1/0/1] shutdown
[Huawei-Atm1/0/1] quit
[Huawei] interface atm 1/0/2
[Huawei-Atm1/0/2] shutdown
[Huawei-Atm1/0/2] quit
[Huawei] interface atm 1/0/3
[Huawei-Atm1/0/3] shutdown
[Huawei-Atm1/0/3] quit
[Huawei] interface atm 1/0/0
[Huawei-Atm1/0/0] shutdown
[Huawei-Atm1/0/0] shdsl mode co
```

Related Topics

5.17.8 set workmode shdsl

5.17.27 shutdown (g.shdsl)

Copyright © Huawei Technologies Co., Ltd.

5.17.18 shdsl pam

Function

The **shdsl pam** command sets the modulation mode on a G.SHDSL interface.

The **undo shdsl pam** command restores the default setting.

By default, a G.SHDSL interface uses the auto mode.

Format

shdsl pam { **16** | **32** | **64** | **128** | **auto** }

undo shdsl pam

Parameters

Parameter	Description	Value
16	Indicates 16 PAM mode.	-
32	Indicates 32 PAM mode.	-
64	Indicates 64 PAM mode.	-
128	Indicates 128 PAM mode.	-
auto	Indicates the auto mode. **NOTE** If a G.SHDSL interface uses the auto mode, only the 16 PAM mode and 32 PAM mode can be configured automatically, the 64 PAM mode and 128 PAM mode must be configured manually.	-

Views

G.SHDSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

To enable the device to connect to the peer device, run the **shdsl pam** command to set the modulation mode for a G.SHDSL interface based on the chip type of the peer device.

 Copyright © Huawei Technologies Co., Ltd.

Prerequisites

The **shutdown** command has been executed on the G.SHDSL interface.

Precautions

If you run the **shdsl pam** command multiple times in the same G.SHDSL interface view, only the latest configuration takes effect.

- When the g-shdsl mode is configured, G.SHDSL interface only supports 16 PAM mode.
- When the g-shdsl.bis mode is configured, G.SHDSL interface supports 16 PAM, 32 PAM, 64 PAM, 128 PAM, and auto modes. By default, when the g-shdsl.bis mode is configured, G.SHDSL interface uses the auto mode.

Example

Configure 32 PAM mode for the G.SHDSL interface card working in ATM transmission mode.

```
<Huawei> system-view
[Huawei] set workmode slot 1 shdsl atm
Warning: Changing the working mode will reset the board in slot 1. Continue? [y/
n]:y
INFO: Resetting board[1] succeeded.
[Huawei] interface atm 1/0/0
[Huawei-Atm1/0/0] shutdown
[Huawei-Atm1/0/0] shdsl pam 32
```

Related Topics

5.17.8 set workmode shdsl

5.17.27 shutdown (g.shdsl)

5.17.19 shdsl pbo

Function

The **shdsl pbo** command adjusts the transmit power of a G.SHDSL interface.

The **undo shdsl pbo** command restores the default mode for the transmit power of a G.SHDSL interface.

By default, the auto mode is used.

Format

shdsl pbo { *value* | **auto** }

undo shdsl pbo

 Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
value	Specifies the adjusted transmit power.	The value is an integer that ranges from 1 to 31, in dB.
auto	Indicates that the transmit power is adjusted automatically.	-

Views

G.SHDSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Normally, an interface adjusts its transmit power based on the line noise to achieve a proper SNR. When the noise is known or the rate automatically adjusted by the interface is inaccurate, you can manually adjust the transmit power.

Prerequisites

The **shutdown** command has been executed on the G.SHDSL interface.

Example

Set the transmit power of the G.SHDSL interface in ATM mode to 20 dB.

```
<Huawei> system-view
[Huawei] set workmode slot 1 shdsl atm
Warning: Changing the working mode will reset the board in slot 1. Continue? [y/
n]:y
INFO: Resetting board[1] succeeded.
[Huawei] interface atm 1/0/0
[Huawei-Atm1/0/0] shutdown
[Huawei-Atm1/0/0] shdsl pbo 20
```

Related Topics

5.17.8 set workmode shdsl

5.17.27 shutdown (g.shdsl)

Copyright © Huawei Technologies Co., Ltd.

5.17.20 shdsl psd

Function

The **shdsl psd** command sets the Power Spectral Density (PSD) mode for a G.SHDSL interface.

By default, the PSD mode of a G.SHDSL interface is symmetric PSD.

Format

shdsl psd { **asymmetry** | **symmetry** }

Parameters

Parameter	Description	Value
asymmetry	Indicates asymmetric PSD. In asymmetric PSD mode, the device uses a high output power for better transmission performance and is suitable for long-distance transmission.	-
symmetry	Indicates symmetric PSD. In symmetric PSD mode, the device is spectral-compatible with other services, uses less power, and is suitable for short-distance transmission.	-

Views

G.SHDSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

To enable the device to transmit services on a G.SHDSL line, run the **shdsl psd** command to set the same PSD mode as the DSLAM for the device.

Copyright © Huawei Technologies Co., Ltd.

NOTE

The PSD describes how the power of a signal or time series is distributed with frequency.

Prerequisites

The G.SHDSL interface has been deactivated using the **shutdown** command.

Precautions

The PSD mode can be configured on G.SHDSL interfaces working in ATM or PTM transmission mode. If the transmission mode is set to ATM and the interface binding mode is set to M-Pair binding, the PSD mode must be configured on the main interface.

Example

Set asymmetric PSD on G.SHDSL interface 1/0/0 working in PTM transmission mode.

```
<Huawei> system-view
[Huawei] set workmode slot 1 shdsl ptm
Warning: Changing the working mode will reset the board in slot 1. Continue? [y/
n]:y
INFO: Resetting board[1] succeeded.
[Huawei] interface ethernet 1/0/0
[Huawei-Ethernet1/0/0] shutdown
[Huawei-Ethernet1/0/0] shdsl psd asymmetry
```

Related Topics

5.17.8 set workmode shdsl

5.17.21 shdsl rate auto

Function

The **shdsl rate auto** command sets the default rate of a G.SHDSL interface.

Format

shdsl rate auto

Parameters

None.

Views

G.SHDSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

 Copyright © Huawei Technologies Co., Ltd.

The default minimum rate of a G.SHDSL interface is 192 kbit/s, and the default maximum rate of a G.SHDSL interface is 15296 kbit/s.

Prerequisites

The **shutdown** command has been executed on the G.SHDSL interface.

Example

Set the default rate of a G.SHDSL interface.

```
<Huawei> system-view
[Huawei] set workmode slot 1 shdsl atm
Warning: Changing the working mode will reset the board in slot 1. Continue? [y/
n]:y
INFO: Resetting board[1] succeeded.
[Huawei] interface atm 1/0/0
[Huawei-Atm1/0/0] shutdown
[Huawei-Atm1/0/0] shdsl rate auto
```

Related Topics

5.17.8 set workmode shdsl

5.17.27 shutdown (g.shdsl)

5.17.22 shdsl rate maximum

Function

The **shdsl rate maximum** command sets the maximum rate on a G.SHDSL interface.

The **undo shdsl rate maximum** command restores the default maximum rate of a G.SHDSL interface.

By default, the maximum rate on a G.SHDSL interface is 15296 kbit/s.

Format

shdsl rate maximum *maximum*

undo shdsl rate maximum

Parameters

Parameter	Description	Value
maximum	Specifies the maximum rate of a G.SHDSL interface.	The value is an integer that ranges from 192 to 15296, in kbit/s. The configured maximum rate must be greater than or equal to the configured minimum rate.

Copyright © Huawei Technologies Co., Ltd.

Views

G.SHDSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

To meet requirements for the transmission rate, run the **shdsl rate maximum** command to set the maximum rate on a G.SHDSL interface.

Prerequisites

The **shutdown** command has been executed on the G.SHDSL interface.

Precautions

If you run the **shdsl rate maximum** command multiple times in the same G.SHDSL interface view, only the latest configuration takes effect.

- In g-shdsl mode, the value must range from 192 to 2304, in kbit/s.
- In g-shdsl.bis mode, when the modulation mode is 16 PAM, the value must range from 192 to 2304, in kbit/s.
- In g-shdsl.bis mode, when the modulation mode is 32 PAM, the value must range from 192 to 5696, in kbit/s.
- In g-shdsl.bis mode, when the modulation mode is 64 PAM, the value must range from 192 to 12736, in kbit/s.
- In g-shdsl.bis mode, when the modulation mode is 128 PAM, the value must range from 192 to 15296, in kbit/s.

NOTE

The value of *maximum* is a multiple of 64 except 2312 kbit/s and 3848 kbit/s. For example, when *maximum* is set to 650 kbit/s, the value 640 kbit/s takes effect. When *maximum* is set to 2312 kbit/s, the value 2312 kbit/s takes effect.

Example

Set the maximum rate of a G.SHDSL interface to 3840 kbit/s.

```
<Huawei> system-view
[Huawei] set workmode slot 1 shdsl atm
Warning: Changing the working mode will reset the board in slot 1. Continue? [y/
n]:y
INFO: Resetting board[1] succeeded.
[Huawei] interface atm 1/0/0
[Huawei-Atm1/0/0] shutdown
[Huawei-Atm1/0/0] shdsl rate maximum 3840
```

Related Topics

5.17.8 set workmode shdsl

5.17.27 shutdown (g.shdsl)

 Copyright © Huawei Technologies Co., Ltd.

5.17.23 shdsl rate minimum

Function

The **shdsl rate minimum** command sets the minimum rate on a G.SHDSL interface.

The **undo shdsl rate minimum** command restores the default minimum rate of a G.SHDSL interface.

By default, the minimum rate on a G.SHDSL interface is 192 kbit/s.

Format

shdsl rate minimum *minimum*

undo shdsl rate minimum

Parameters

Parameter	Description	Value
minimum	Specifies the minimum rate of a G.SHDSL interface.	The value is an integer that ranges from 192 to 15296, in kbit/s. The configured minimum rate must be smaller than or equal to the configured maximum rate.

Views

G.SHDSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

To meet requirements for the transmission rate, run the **shdsl rate minimum** command to set the minimum rate on a G.SHDSL interface.

Prerequisites

The **shutdown** command has been executed on the G.SHDSL interface.

Precautions

If you run the **shdsl rate minimum** command multiple times in the same G.SHDSL interface view, only the latest configuration takes effect.

Copyright © Huawei Technologies Co., Ltd.

- In g-shdsl mode, the value must range from 192 to 2304, in kbit/s.
- In g-shdsl.bis mode, when the modulation mode is 16 PAM, the value must range from 192 to 2304, in kbit/s.
- In g-shdsl.bis mode, when the modulation mode is 32 PAM, the value must range from 192 to 5696, in kbit/s.
- In g-shdsl.bis mode, when the modulation mode is 64 PAM, the value must range from 192 to 12736, in kbit/s.
- In g-shdsl.bis mode, when the modulation mode is 128 PAM, the value must range from 192 to 15296, in kbit/s.

NOTE

The value of *minimum* is a multiple of 64 except 2312 kbit/s and 3848 kbit/s. For example, when *minimum* is set to 650 kbit/s, the value 640 kbit/s takes effect. When *minimum* is set to 2312 kbit/s, the value 2312 kbit/s takes effect.

Example

Set the minimum rate of a G.SHDSL interface to 320 kbit/s.

```
<Huawei> system-view
[Huawei] set workmode slot 1 shdsl atm
Warning: Changing the working mode will reset the board in slot 1. Continue? [y/
n]:y
INFO: Resetting board[1] succeeded.
[Huawei] interface atm 1/0/0
[Huawei-Atm1/0/0] shutdown
[Huawei-Atm1/0/0] shdsl rate minimum 320
```

Related Topics

5.17.8 set workmode shdsl

5.17.27 shutdown (g.shdsl)

5.17.24 shdsl tc mode

Function

The **shdsl tc mode** command configures the extended compatibility mode at the transport layer of a G.SHDSL interface. A G.SHDSL interface supports IEEE and ITU-T handshake modes.

The **undo shdsl tc mode** command restores the default setting.

By default, the extended compatibility mode at the transport layer of a G.SHDSL interface is **efm**.

Format

shdsl tc mode { **efm** | **ptm_6465o** | **efm_6465o** }

undo shdsl tc mode

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
efm	Configures a G.SHDSL interface to work in efm mode. The efm mode only applies to the IEEE handshake mode.	-
ptm_6465o	Configures a G.SHDSL interface to work in ptm_6465o mode. The ptm_6465o mode only applies to the ITU-T handshake mode.	-
efm_6465o	Configures a G.SHDSL interface to work in efm_6465o mode. The efm_6465o mode applies to IEEE and ITU-T handshake modes.	-

Views

G.SHDSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The handshake mode varies according to the chip type on the DSLAM. You need to configure the extended compatibility mode at the transport layer of the local interface so that the local device can communicate with the DSLAM using IEEE and ITU-T handshake modes.

Prerequisites

Before configuring the extended compatibility mode at the transport layer of a G.SHDSL interface, complete the following configurations:

1. Run the **set workmode** command to set the transmission mode to PTM.
2. Run the **shutdown** command to deactivate all PTM interfaces.
3. Run the **shdsl mode** command to set the working mode of the G.SHDSL interface to CPE (client) mode.

Precautions

Only the PTM main interface supports this command. The configured extended compatibility mode at the transport layer takes effect for all PTM interfaces.

Example

Set the extended compatibility mode at the transport layer of Ethernet0/0/0 to efm_6465o.

```
<Huawei> system-view
[Huawei] set workmode slot 0 shdsl ptm
```

 Copyright © Huawei Technologies Co., Ltd.

```
Warning: Changing the working mode will reset the board in slot 0. Continue? [y/
n]:y
INFO: Resetting board[0] succeeded.
[Huawei] interface ethernet0/0/0
[Huawei-Ethernet0/0/0] shutdown
[Huawei-Ethernet0/0/0] shdsl mode cpe
[Huawei-Ethernet0/0/0] shdsl tc mode efm_6465o
```

Related Topics

5.17.8 set workmode shdsl

5.17.13 shdsl compatibility

5.17.27 shutdown (g.shdsl)

5.17.25 shdsl worst case target snr margin upstream

Function

The **shdsl worst case target snr margin upstream** command sets the lowest uplink signal to noise ratio (SNR) on a G.SHDSL interface.

The **undo shdsl worst case target snr margin upstream** command restores the default setting.

By default, the lowest uplink SNR on a G.SHDSL interface is 0 dB.

Format

shdsl worst case target snr margin upstream *value*

undo shdsl worst case target snr margin upstream

Parameters

Parameter	Description	Value
value	Specifies the lowest uplink SNR on a G.SHDSL interface.	The value is an integer that ranges from 0 to 6, in dB.

Views

G.SHDSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

You can set the lowest uplink SNR for a G.SHDSL interface to manage the device.

Copyright © Huawei Technologies Co., Ltd.

If the actual lowest SNR of the device is smaller than the configured lowest uplink SNR, the device is disconnected.

Prerequisites

The **shutdown** command has been executed on the G.SHDSL interface.

Precautions

If you run the **shdsl worst case target snr margin upstream** command multiple times in the same G.SHDSL interface view, only the latest configuration takes effect.

Example

Set the lowest uplink SNR on a G.SHDSL interface to 6 dB.

```
<Huawei> system-view
[Huawei] set workmode slot 1 shdsl atm
Warning: Changing the working mode will reset the board in slot 1. Continue? [y/
n]:y
INFO: Resetting board[1] succeeded.
[Huawei] interface atm 1/0/0
[Huawei-Atm1/0/0] shutdown
[Huawei-Atm1/0/0] shdsl worst case target snr margin upstream 6
```

Related Topics

5.17.8 set workmode shdsl

5.17.27 shutdown (g.shdsl)

5.17.26 shdsl worst case target snr margin downstream

Function

The **shdsl worst case target snr margin downstream** command sets the lowest downlink signal to noise ratio (SNR) on a G.SHDSL interface.

The **undo shdsl worst case target snr margin downstream** command restores the default setting.

By default, the lowest downlink SNR on a G.SHDSL interface is 0 dB.

Format

shdsl worst case target snr margin downstream *value*

undo shdsl worst case target snr margin downstream

Parameters

Parameter	Description	Value
value	Specifies the lowest downlink SNR on a G.SHDSL interface.	The value is an integer that ranges from 0 to 6, in dB.

 Copyright © Huawei Technologies Co., Ltd.

Views

G.SHDSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

You can set the lowest downlink SNR for a G.SHDSL interface to manage the device.

If the actual lowest SNR of the device is smaller than the configured lowest downlink SNR, the device is disconnected.

Prerequisites

The **shutdown** command has been executed on the G.SHDSL interface.

Precautions

If you run the **shdsl worst case target snr margin downstream** command multiple times in the same G.SHDSL interface view, only the latest configuration takes effect.

Example

Set the lowest downlink SNR on a G.SHDSL interface to 6 dB.

```
<Huawei> system-view
[Huawei] set workmode slot 1 shdsl atm
Warning: Changing the working mode will reset the board in slot 1. Continue? [y/
n]:y
INFO: Resetting board[1] succeeded.
[Huawei] interface atm 1/0/0
[Huawei-Atm1/0/0] shutdown
[Huawei-Atm1/0/0] shdsl worst case target snr margin downstream 6
```

Related Topics

5.17.8 set workmode shdsl

5.17.27 shutdown (g.shdsl)

5.17.27 shutdown (g.shdsl)

Function

The **shutdown** command deactivates a G.Single-pair high-speed Digital Subscriber Line (G.SHDSL) interface.

The **undo shutdown** command activates a G.SHDSL interface.

By default, a G.SHDSL interface is activated.

 Copyright © Huawei Technologies Co., Ltd.

Format

shutdown

undo shutdown

Parameters

None

Views

G.SHDSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

G.SHDSL interfaces must be activated before transmitting services. Activation of a G.SHDSL interface refers to the training between a Digital Subscriber Line Access Multiplexer (DSLAM) and a Customer Premises Equipment (CPE). During the training, the two devices check the line distance and status based on parameters such as the transmission standard, upstream and downstream line rates, and specified noise margin to determine whether they can work properly under the existing conditions. If the training succeeds, the G.SHDSL interface on the CPE is activated and can transmit services between the two devices.

The device functions as a CPE and aggregates services to a DSLAM by using a G.SHDSL interface.

After the device starts, its G.SHDSL interface is automatically activated. The G.SHDSL interface remains activated as long as its G.SHDSL line works properly. To enable the device to communicate with a DSLAM, run the **undo activate** command to deactivate the G.SHDSL interface on the device, set parameters such as the transmission standard, interface binding mode, power spectral density (PSD) mode, and line probing function for the interface, and then reactivate the interface to make the configured parameters take effect.

Precautions

After a G.SHDSL interface is deactivated, the device is disconnected from a DSLAM. To enable the G.SHDSL interface to transmit services, reactivate this G.SHDSL interface.

Example

Activate G.SHDSL interface 1/0/0 working in ATM transmission mode.

```
<Huawei> system-view
[Huawei] interface atm 1/0/0
[Huawei-Atm1/0/0] undo shutdown
```

 Copyright © Huawei Technologies Co., Ltd.

Related Topics

5.17.5 interface atm (g.shdsl)

5.18 IMA Commands

NOTE

AR1200 series, AR2204, AR2220E, AR2220, AR2240, AR3260 and AR3670 support E1-IMA interfaces.

5.18.1 clock (E1-IMA)

Function

The **clock** command configures the clock mode of an E1-IMA interface.

The **undo clock** command restores the default clock mode of an E1-IMA interface.

By default, the clock mode of an E1-IMA interface is slave (**slave**).

Format

clock { **master** | **slave** }

undo clock

Parameters

Parameter	Description	Value
master	Indicates that the clock mode of an E1-IMA interface is master.	-
slave	Indicates that the clock mode of an E1-IMA interface is slave.	-

Views

E1-IMA interface view

Default Level

2: Configuration level

Usage Guidelines

When the router is connected to the peer device through E1-IMA interfaces, one E1-IMA interface must work in master clock mode and the other must work in slave clock mode.

Example

Set the clock mode to master on the interface ATM 2/0/0.

Copyright © Huawei Technologies Co., Ltd.

```
<Huawei> system-view
[Huawei] interface atm 2/0/0
[Huawei-Atm2/0/0] clock master
```

5.18.2 differential-delay

Function

The **differential-delay** command configures the maximum differential delay of member links in an IMA group.

The **undo differential-delay** command restores the default maximum differential delay of member links in an IMA group.

By default, the maximum differential delay of member links in an IMA group is 25 ms.

Format

differential-delay *interval*

undo differential-delay

Parameters

Parameter	Description	Value
interval	Specifies the maximum differential delay of member links in an IMA group.	The value is an integer that ranges from 25 to 100, in milliseconds.

Views

IMA group view

Default Level

2: Configuration level

Usage Guidelines

The local device sends data over the member links in an IMA group at the same time. However, there is a delay when the data reaches the peer device. The **differential-delay** command configures the maximum differential delay of member links in an IMA group.

If the maximum differential delay of member links in an IMA group exceeds the set *interval*, the link-layer protocol of the IMA link becomes Down.

Example

Set the maximum differential delay of member links in an IMA group to 25 ms.

```
<Huawei> system-view
[Huawei] interface ima-group 2/0/0
```

 Copyright © Huawei Technologies Co., Ltd.

```
[Huawei-Ima-group2/0/0] differential-delay 25
```

Related Topics

5.18.12 interface ima-group

5.18.3 display interface atm (E1-IMA)

Function

The **display interface atm** command displays information about E1-IMA interfaces.

Format

display interface atm [*interface-number*]

Parameters

Parameter	Description	Value
interface-number	Displays information about a specified E1-IMA interface. If no interface number is specified, information about all the interfaces of this type is displayed.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

Run the **display interface atm** command to obtain the status of and statistics on an interface when you monitor the interface status or locate faults on the interface. You can collect traffic statistics and diagnose faults on the interface according to the command output.

Example

Display information about the E1-IMA interface ATM 2/0/0.

```
<Huawei> display interface atm 2/0/0
Atm2/0/0 current state : UP
Line protocol current state : UP
Last line protocol up time : 2012-07-24 14:13:49
```


Copyright © Huawei Technologies Co., Ltd.

```
Description:HUAWEI, AR Series, Atm2/0/0 Interface
Route Port,The Maximum Transmit Unit is 1500
Internet protocol processing : disabled
AAL enabled: AAL5, Maximum PVCs: 8
PVCs on main-interface: 0 (Total PVCs: 0)
Last physical up time   : 2012-07-24 14:13:49
Last physical down time : 2012-07-24 14:07:06
Current system time: 2012-07-25 15:29:46
  ATM over E1, Scramble is Enabled, baudrate is 1920000 bps
  Frame-format is NO-Crc4-Adm, Line Code is Hdb3.
  Source Clock is Slave, Loopback is Not Set.
Last 300 seconds input rate 0 bytes/sec 0 bits/sec 0 packets/sec
Last 300 seconds output rate 0 bytes/sec 0 bits/sec 0 packets/sec

Input: 0 packets, 0 bytes
  Total Error: 0
  CRC: 0
Output: 0 packets, 0 bytes
    Input bandwidth utilization  :    0%
    Output bandwidth utilization :    0%
```

Table 5-63 Description of the display interface atm command output

Item	Description
Atm2/0/0 current state	Physical status of ATM 2/0/0: • UP: indicates that the physical status of the interface is Up. • DOWN: indicates that the interface has a fault. • Administratively down: indicates that the administrator has run the **shutdown** command on the interface.
Current state of the line protocol	Link layer protocol status of the interface: • UP: indicates that the link layer protocol status of the interface is Up. • DOWN: indicates that the link layer protocol of the interface is Down or no IP address is assigned to the interface.
Last line protocol up time	Last time when the link layer protocol of the interface goes Up.
Description	Interface description. The description contains a maximum of 242 case-sensitive characters, with spaces supported. This field describes functions of the interface.
The Maximum Transmit Unit is	MTU of the interface. By default, the MTU is 1488 bytes. Packets whose size is greater than the MTU are fragmented before being transmitted. If non-fragmentation is configured, these packets are discarded.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Internet protocol processing	If no IP address is assigned to the interface, Internet protocol processing: disabled is displayed. If an IP address is assigned to the interface, the IP address and subnet mask are displayed.
AAL enabled	ATM adaptation layer. **NOTE** The device supports only ATM Adaptation Layer Type 5 (AAL5).
Maximum PVCs	Maximum number of virtual circuits (VCs).
PVCs on main-interface: (Total PVCs:)	Number of PVCs on the main interface (total number of VCs on both the main interface and sub-interfaces).
Last physical up time	Last time when the interface went Up physically. If the value of this field is displayed as "-", the physical status of the interface has not changed. If the time zone is configured and the daylight saving time is used, the time is in YYYY/MM/DD HH:MM:SS UTC±HH:MM DST format.
Last physical down time	Last time when the interface went Down physically. If the value of this field is displayed as "-", the physical status of the interface has not changed. If the time zone is configured and the daylight saving time is used, the time is in YYYY/MM/DD HH:MM:SS UTC±HH:MM DST format.
Current system time	Current system time. If the time zone is configured and the daylight saving time is used, the time is in YYYY/MM/DD HH:MM:SS UTC±HH:MM DST format.
Scramble is	Payload scramble enabling on the E1-IMA interface. The scramble function can be configured by using the **5.18.15 scramble** command.
Frame-format is	Frame format of the E1-IMA interface. The frame-format can be configured by using the **5.18.5 frame-format** command.
Line Code is	Line code of the E1-IMA interface.
Source Clock is	Clock mode of the E1-IMA interface. The clock mode can be configured by using the **5.18.1 clock (E1-IMA)** command.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Loopback is	Loopback mode of the E1-IMA interface. The loopback mode can be configured by using the **5.18.13 loopback** command.
Last 300 seconds input rate	Incoming packet rate (bit/s and pps) within the last 300 seconds.
Last 300 seconds output rate	Outgoing packet rate (bit/s and pps) within the last 300 seconds.
Input	Total number of received packets.
Output	Total number of sent packets.
Input bandwidth utilization	Percentage of the incoming packet rate to the total bandwidth.
Output bandwidth utilization	Percentage of the outgoing packet rate to the total bandwidth.

Related Topics

5.1.16 shutdown (interface view)
5.18.15 scramble
5.18.5 frame-format
5.18.1 clock (E1-IMA)
5.18.13 loopback

5.18.4 display interface ima-group

Function

The **display interface ima-group** command displays information about IMA groups.

Format

display interface ima-group [*interface-number*]

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
interface-number	Displays information about a specified IMA group. If no IMA group number is specified, information about all IMA groups is displayed.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

Run the **display interface ima-group** command to obtain the status of and statistics on the IMA group when you monitor the interface status or locate faults on an interface. You can collect traffic statistics and diagnose faults on the interface according to the command output.

Example

Display information about the IMA group 2/0/0.

```
<Huawei> display interface ima-group 2/0/0
Ima-group2/0/0 current state : UP
Line protocol current state : UP
Last line protocol up time : 2013-01-08 16:28:55
Description:HUAWEI, AR Series, Ima-group2/0/0 Interface
Route Port,The Maximum Transmit Unit is 1500
Internet Address is 1.1.1.1/24
AAL enabled: AAL5, Maximum PVCs: 8
PVCs on main-interface: 4 (Total PVCs: 4)
Current system time: 2013-01-08 17:55:53
Physical layer is ATM over IMA
 Maximum allowed differential delay is: 25ms, Minimum required active links num:
 1
 Tx frame length: 32, symmetry: symmetrical configuration and operation
 Ne Tx clock mode CTC
 Ima protocol version: Version 1.0(standard implementation)
 Ima group near-end state is: operational
 Ima group far-end state is: operational
  LinkName Atm2/0/0
   NeLink TxLid 1, Tx Link state is active
   NeLink RxLid 1, Rx link state is active
   FeLink TxLid 1, Tx Link state is active
   FeLink RxLid 1, Rx link state is active
   Defect: NONE
  LinkName Atm2/0/1
   NeLink TxLid 2, Tx Link state is active
   NeLink RxLid 2, Rx link state is active
```

 Copyright © Huawei Technologies Co., Ltd.

```
  FeLink TxLid 2, Tx Link state is active
  FeLink RxLid 2, Rx link state is active
  Defect: NONE
Last 300 seconds input rate 58701 bytes/sec 469608 bits/sec 611 packets/sec
Last 300 seconds output rate 58634 bytes/sec 469072 bits/sec 611 packets/sec

Input: 3317314 packets, 318312108 bytes
Output: 3317257 packets, 318305028 bytes
   Input bandwidth utilization  : 6.38%
   Output bandwidth utilization : 6.38%
```

Table 5-64 Description of the display interface ima-group command output

Item	Description
Ima-group2/0/0 current state	Status of IMA-group 2/0/0: • UP: indicates that the physical status of the interface is Up. • DOWN: indicates that the interface has a fault. • Administratively down: indicates that the administrator has run the **shutdown** command on the interface.
Line protocol current state	Link layer protocol status of the interface: • UP: indicates that the link layer protocol status of the interface is Up. • DOWN: indicates the link layer protocol status of the interface is Down.
Last line protocol up time	Last time when the link layer protocol of the interface goes Up.
Description	Interface description. The description contains a maximum of 242 case-sensitive characters, with spaces supported. This field describes functions of the interface.
The Maximum Transmit Unit is	MTU of the interface. By default, the MTU is 1488 bytes. Packets whose size is greater than the MTU are fragmented before being transmitted. If non-fragmentation is configured, these packets are discarded.
Internet protocol processing	If no IP address is assigned to the interface, Internet protocol processing: disabled is displayed. If an IP address is assigned to the interface, the IP address and subnet mask are displayed.
AAL enabled	ATM adaptation layer. **NOTE** The device supports only AAL5.
Maximum PVCs	Maximum number of VCs.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
PVCs on main-interface: (Total PVCs:)	Number of PVCs on the main interface (total number of VCs on both the main interface and sub-interfaces).
Current system time	Current system time. If the time zone is configured and the daylight saving time is used, the time is in YYYY/MM/DD HH:MM:SS UTC±HH:MM DST format.
Physical layer is	Type of the physical layer.
Maximum allowed differential delay is	Maximum differential delay of member links in the IMA group. Maximum differential delay of member links in an IMA group can be configured by using the **5.18.2 differential-delay** command.
Minimum required active links num	Minimum number of available member links in the IMA group. Minimum number of available member links in an IMA group can be configured by using the **5.18.14 min-active-links** command.
Tx frame length	Number of the cells contained in the IMA frame. Number of the cells contained in an IMA frame can be configured by using the **5.18.6 frame-length** command.
symmetry: symmetrical configuration and operation	Power spectral density (PSD) mode of the interface.
Ne Tx clock mode CTC	Clock mode of the IMA group. The clock mode can be configured by using the **5.18.8 ima-clock** command.
Ima protocol version	Standard used by the IMA group. The standard used by an IMA group can be configured by using the **5.18.10 ima-standard** command.
Ima group near-end state is	State of the local IMA group.
Ima group far-end state is	State of the remote IMA group.
NeLink TxLid 1, Tx Link state is active	LID of the transmit link at the local end. The transmit link status is active.
NeLink RxLid 1, Rx link state is active	LID of the receive link at the local end. The receive link status is active.
FeLink TxLid 1, Tx Link state is active	LID of the transmit link at the remote end. The transmit link status is active.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
FeLink RxLid 1, Rx link state is active	LID of the receive link at the remote end. The receive link status is active.
Defect	Link fault.
Last 300 seconds input rate	Incoming packet rate (bit/s and pps) within the last 300 seconds.
Last 300 seconds output rate	Outgoing packet rate (bit/s and pps) within the last 300 seconds.
Input	Total number of received packets.
Output	Total number of sent packets.
Input bandwidth utilization	Percentage of the incoming packet rate to the total bandwidth.
Output bandwidth utilization	Percentage of the outgoing packet rate to the total bandwidth.

Related Topics

5.1.16 shutdown (interface view)
5.18.2 differential-delay
5.18.6 frame-length
5.18.10 ima-standard
5.18.14 min-active-links

5.18.5 frame-format

Function

The **frame-format** command configures the frame format for an E1-IMA interface.

The **undo frame-format** command restores the default frame format for an E1-IMA interface.

By default, the frame format of an E1-IMA interface is No-CRC4 ADM.

Format

frame-format { **crc4-adm** | **no-crc4-adm** }

undo frame-format

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
crc4-adm	Indicates that the frame format of the E1-IMA interface is CRC4 ADM.	-
no-crc4-adm	Indicates that the frame format of the E1-IMA interface is No-CRC4 ADM.	-

Views

E1-IMA interface view

Default Level

2: Configuration level

Usage Guidelines

ATM direct mapping (ADM) technology maps ATM sells transmitted over the E1 lines to E1 frames.

To ensure the normal service transmission on the links, run the **frame-format** command to configure the E1-IMA interface to use the same frame format as the peer device.

Example

Set the frame format to No-CRC4 ADM on the interface ATM 2/0/0.

```
<Huawei> system-view
[Huawei] interface atm 2/0/0
[Huawei-Atm2/0/0] frame-format no-crc4-adm
```

5.18.6 frame-length

Function

The **frame-length** command configures the number of the ATM cells contained in an IMA frame.

The **undo frame-length** command restores the default number of the ATM cells contained in an IMA frame.

By default, an IMA frame contains 128 ATM cells.

Format

frame-length { **32** | **64** | **128** | **256** }

undo frame-length

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
32	Indicates that an IMA frame contains 32 ATM cells.	-
64	Indicates that an IMA frame contains 64 ATM cells.	-
128	Indicates that an IMA frame contains 128 ATM cells.	-
256	Indicates that an IMA frame contains 256 ATM cells.	-

Views

IMA group view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

You must configure the same number of the ATM cells contained in an IMA frame as the peer device; otherwise, the IMA protocol negotiation fails.

Precautions

After the **frame-length** command is executed, run the **shutdown** and **undo shutdown** commands in the IMA group view to make the configuration take effect.

Example

Set the number of the cells contained in an IMA frame to 64.

```
<Huawei> system-view
[Huawei] interface ima-group 2/0/0
[Huawei-Ima-group2/0/0] frame-length 64
```

Related Topics

5.18.12 interface ima-group

5.18.7 ima ima-group

Function

The **ima ima-group** command adds an interface to a specified IMA group.

The **undo ima ima-group** command removes an interface from an IMA group.

Format

ima ima-group *interface-number*

Copyright © Huawei Technologies Co., Ltd.

undo ima ima-group

Parameters

Parameter	Description	Value
interface-number	Specifies the number of an IMA group. The value is in slot ID/subcard ID/interface serial number format.	The slot ID of the IMA group must be same as that of the E1-IMA interface. The interface serial number ranges from 0 to 3.

Views

E1-IMA interface view, G.SHDSL interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

When you require high bandwidth that a single E1-IMA link or G.SHDSL link cannot provide, you can bind multiple E1-IMA links or G.SHDSL links to an IMA group to increase the bandwidth.

Precautions

Before adding an E1-IMA or G.SHDSL interface to the IMA group, delete all network-layer configurations on the E1-IMA or G.SHDSL interface. For example, before running the **ima ima-group** command, you must run the **undo ip address** command to delete the IP address.

When removing a link from the original IMA group to a new IMA group, you need to remove two interfaces of the link from the original IMA group, and then add the two interfaces of the link to the new IMA group.

If two devices on both ends of a link cannot communicate after the link is removed from an original IMA group to a new IMA group, run the **shutdown** and **undo shutdown** commands in the IMA group view on the two devices.

Example

Add the E1-IMA interface 2/0/0 to the IMA group 2/0/0.

```
<Huawei> system-view
[Huawei] interface atm 2/0/0
[Huawei-Atm2/0/0] ima ima-group 2/0/0
```

Related Topics

5.18.11 interface atm (E1-IMA)

Copyright © Huawei Technologies Co., Ltd.

5.18.8 ima-clock

Function

The **ima-clock** command configures the clock mode of an IMA group.

The **undo ima-clock** command restores the default clock mode of an IMA group.

By default, the clock mode of an IMA group is the common transmit clock (**CTC**).

Format

ima-clock { **ctc** [**link-number** *number*] | **itc** }

undo ima-clock

Parameters

Parameter	Description	Value
ctc	Indicates that the clock mode of an IMA group is CTC.	-
link-number *number*	Specifies the E1-IMA link number, which is the link number of a clock source.	The value is an integer that ranges from 0 to 3.
itc	Indicates that the clock mode of an IMA group is independent transmit clock (ITC).	-

Views

IMA group view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

An IMA group supports the following clock modes:

- CTC: In this mode, all member links of an IMA group share a clock source, that is either an external clock or a clock of a member link.
- ITC: In this mode, the member links of an IMA group use at least two different clock sources.

Precautions

- If an IMA group uses the ITC clock mode, the clock mode of its member interfaces, namely, E1-IMA interfaces, must be set to slave.
- If an IMA group uses the CTC clock mode, E1-IMA interfaces must be set to master.

Copyright © Huawei Technologies Co., Ltd.

Example

Configure the ITC clock mode for an IMA group.

```
<Huawei> system-view
[Huawei] interface ima-group 2/0/0
[Huawei-Ima-group2/0/0] ima-clock itc
```

Related Topics

5.18.12 interface ima-group

5.18.9 ima-id

Function

The **ima-id** command sets the IMA ID of an IMA group.

The **undo ima-id** command restores the default IMA ID of an IMA group.

By default, the interface sequence number is used as the IMA ID of an IMA group.

Format

ima-id *ima-id*

undo ima-id

Parameters

Parameter	Description	Value
ima-id	Specifies the IMA ID of an IMA group.	The value is an integer that ranges from 0 to 255.

Views

IMA group view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

You can use the **ima-id** command to set the IMA ID of an IMA group.

Precautions

This command can be used only when no E1-IMA link or G.SHDSL link joins an IMA group.

 Copyright © Huawei Technologies Co., Ltd.

Example

Set the IMA ID of an IMA group to 1.

```
<Huawei> system-view
[Huawei] interface ima-group 2/0/0
[Huawei-Ima-group2/0/0] ima-id 1
```

Related Topics

5.18.12 interface ima-group

5.18.10 ima-standard

Function

The **ima-standard** command configures the standard used by an IMA group.

The **undo ima-standard** command restores the default standard used by an IMA group.

By default, the standard used by an IMA group is set to **normal**.

Format

ima-standard { **normal** | **standard-v10** | **standard-v11** | **alternate-v10** }

undo ima-standard

Parameters

Parameter	Description	Value
normal	The **normal** parameter has different meanings for IMA groups with different member interfaces: • For an IMA group with G.SHDSL member interfaces, it indicates that the standard used by the IMA group is set to V1.1 (standard implementation). • For an IMA group with E1-IMA member interfaces, it indicates that the IMA group automatically uses the same standard as the peer IMA group. **NOTE** If the peer IMA group uses V1.0 (other implementation), the local IMA group cannot automatically use the same standard as the peer IMA group.	-
standard-v10	Indicates that the standard used by the current IMA group is set to V1.0 (standard implementation).	-
standard-v11	Indicates that the standard used by the current IMA group is set to V1.1 (standard implementation). **NOTE** An IMA group with G.SHDSL member interfaces does not support this parameter.	-

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
alternate-v10	Indicates that the standard used by the current IMA group is set to V1.0 (other implementation).	-

Views

IMA group view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

To ensure the normal service transmission on links, run the **ima-standard** command to configure the IMA group to use the same standard as the peer device.

For a local IMA group with E1-IMA member interfaces, if the standard used by the peer IMA group is unknown, specify the **normal** parameter to configure the local IMA group to automatically use the same standard as the peer IMA group.

Precautions

After the **ima-standard** command is executed, run the **shutdown** and **undo shutdown** commands in the IMA group view to make the configuration take effect.

If there are multiple IMA groups composed of G.SHDSL interfaces on the device, these IMA groups must be configured with the same standard.

If the **normal** parameter is specified on both the local and remote devices, the standard used by the current IMA group is set to V1.1 (standard implementation).

Example

Set the standard to V1.0 for the current IMA group 2/0/0.

```
<Huawei> system-view
[Huawei] interface ima-group 2/0/0
[Huawei-Ima-group2/0/0] ima-standard standard-v10
[Huawei-Ima-group2/0/0] shutdown
[Huawei-Ima-group2/0/0] undo shutdown
```

Related Topics

5.18.12 interface ima-group

5.18.11 interface atm (E1-IMA)

Function

The **interface atm** command enters the E1-IMA interface view.

Copyright © Huawei Technologies Co., Ltd.

Format

interface atm *interface-number*

Parameters

Parameter	Description	Value
interface-number	Indicates the number of the E1-IMA interface.	-

Views

System view

Default Level

2: Configuration level

Usage Guidelines

Run the **interface atm** command to enter the E1-IMA interface view and configure attributes for the E1-IMA interface.

Example

Enter the E1-IMA 2/0/0 view.

```
<Huawei> system-view
[Huawei] interface atm 2/0/0
[Huawei-Atm2/0/0]
```

Related Topics

5.18.3 display interface atm (E1-IMA)

5.18.12 interface ima-group

Function

The **interface ima-group** command creates an IMA group and enters the IMA group view.

The **undo interface ima-group** command deletes a created IMA group.

Format

interface ima-group *interface-number*

undo interface ima-group *interface-number*

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
interface-number	Specifies the interface number of the IMA group.	The value is in slot ID/0/serial number format. The value of the serial number ranges from 0 to 3.

Views

System view

Default Level

2: Configuration level

Usage Guidelines

Before binding multiple E1-IMA links or G.SHDSL links into an IMA group, you need to create an IMA group.

Example

Create an IMA group and enter the IMA group 2/0/0 view.

```
<Huawei> system-view
[Huawei] interface ima-group 2/0/0
[Huawei-Ima-group2/0/0]
```

Related Topics

5.18.11 interface atm (E1-IMA)

5.18.13 loopback

Function

The **loopback** command configures the loopback mode on an E1-IMA interface.

The **undo loopback** command cancels the loopback mode of an E1-IMA interface.

By default, loopback detection is disabled.

Format

loopback { **local** | **payload** | **remote** }

undo loopback

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
local	Indicates that the loopback mode of the E1-IMA interface is set to local.	-
payload	Indicates that the loopback mode of the E1-IMA interface is set to payload.	-
remote	Indicates that the loopback mode of the E1-IMA interface is set to remote.	-

Views

E1-IMA interface view

Default Level

2: Configuration level

Usage Guidelines

The loopback detection function monitors the interface status or cable status. This function must be disabled when devices are working properly.

- The **local** loopback tests whether the local device works properly by looping back outgoing packets to itself.
- The **payload** loopback tests whether the local device works properly by looping back the valid payload of outgoing packets. Generally, frames transmitted by timeslot 0 are not looped back.
- The **remote** loopback tests whether the link between the two devices works properly by looping back the packets received from its peer device to the peer device.

Example

Set the loopback mode to payload on the interface ATM 2/0/0.

```
<Huawei> system-view
[Huawei] interface atm 2/0/0
[Huawei-Atm2/0/0] loopback payload
```

5.18.14 min-active-links

Function

The **min-active-links** command configures the minimum number of available member links in an IMA group.

The **undo min-active-links** command restores the default minimum number of available member links in an IMA group.

By default, the minimum number of available member links in an IMA group is 1.

Copyright © Huawei Technologies Co., Ltd.

Format

min-active-links *number*

undo min-active-links

Parameters

Parameter	Description	Value
number	Specifies the minimum number of available member links in an IMA group.	The value is an integer that ranges from 1 to 4.

Views

IMA group view

Default Level

2: Configuration level

Usage Guidelines

The bandwidth for an IMA group is determined by the minimum number of available member links in the group.

By default, the minimum number of available member links in an IMA group is 1. An IMA group can work as long as one member link is available.

Example

Set the minimum number of available member links in the IMA group 2/0/0 to 2.

```
<Huawei> system-view
[Huawei] interface ima-group 2/0/0
[Huawei-Ima-group2/0/0] min-active-links 2
```

Related Topics

5.18.12 interface ima-group

5.18.15 scramble

Function

The **scramble** command enables the scramble function on an E1-IMA interface.

The **undo scramble** command disables the scramble function on an E1-IMA interface.

By default, the payload scramble function is enabled on an E1-IMA interface.

Copyright © Huawei Technologies Co., Ltd.

Format

scramble

undo scramble

Parameters

None

Views

E1-IMA interface view

Default Level

2: Configuration level

Usage Guidelines

In the digital communication system, the scramble function is used to convert digital signals into pseudo random digital signals with the same meaning and same bit rate for easy transmission and storage.

The **scramble** command takes effect only on the payload rather than cell header.

- The scramble function can effectively prevent successive 0 and 1 in the sent data.
- The disabled scramble function does not convert the signals in sent data and not restore the signals in received data.

Example

Enable the payload scramble function on the E1-IMA interface ATM 2/0/0.

```
<Huawei> system-view
[Huawei] interface atm 2/0/0
[Huawei-Atm2/0/0] scramble
```

5.19 PON Interface Configuration Commands

5.19.1 display epon-info interface pon

Function

The **display epon-info interface pon** command displays information about an Ethernet passive optical network (EPON) interface.

Format

display epon-info interface pon *interface-number*

 Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
interface-number	Specifies the number of an EPON interface.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

You can use this command to check the attributes of an EPON interface, including the laser working mode, signal status, logical link identifier (LLID), encryption function status (enabled or disabled), encryption mode, loopback mode, and MAC address, password, or logical identifier and check code for authentication.

Example

Display information about EPON interface PON1/0/0.

```
<Huawei> display epon-info interface pon 1/0/0
 ------------------------------------------------------------------
  Mac-address        : 00E1-6600-0000
  Password           : %@%@GlX%9DYkb@mWA.Xsq}U7$RAuesDv~ix|CA/e>|<EVZS:RAx$%@%@
  Loid               : hwloid
  Check code         : eponcode
  Laser state        : Auto
  Signal state       : Up
  Loopback state     : No loopback
  Encryption state   : Off
  Encryption mode    : Triple Churning
  Rogue ONT state    : No
  Port role          : Protect
  Active state       : Standby
 ------------------------------------------------------------------
 ---------------------------------------------------
  LLID                  Register state
 ---------------------------------------------------
  -                     Unregistered
 ---------------------------------------------------
```

Table 5-65 Description of the display epon-info interface pon command output

Item	Description
Mac-address	MAC address that the EPON interface uses for authentication.
Password	Password that the EPON interface uses for authentication.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Loid	Logical identifier that the EPON interface uses for authentication.
Check code	Check code that the EPON interface uses for authentication.
Laser state	Laser working status of the optical module on the EPON interface. • Auto: indicates that the optical module generates optical signals when data needs to be transmitted and stops generating optical signals when no data needs to be transmitted. • On: indicates that the optical module continuously generates optical signals. • Off: indicates that the optical module does not generate optical signals.
Signal state	Optical signal status on the EPON interface. • Up: indicates that the optical signal is received. • Down: indicates that the optical signal is not received or the optical power is beyond the normal range.
Loopback state	Loopback status on the EPON interface. • No loopback: indicates that loopback is not configured on the interface. • GE-PHY internal loopback: indicates internal loopback at the GE physical layer. • GE-PHY line loopback: indicates line loopback at the GE physical layer. • Unknown loopback state: indicates that the hardware does not support the loopback function.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
Encryption state	Whether the encryption function is enabled. • Off: indicates that the encryption function is disabled. • Downstream encryption: indicates that encryption is enabled for downstream data. • Down & Up stream encryption: indicates that encryption is enabled for both upstream data and downstream data.
Encryption mode	Encryption mode used on the EPON interface. Currently, the device supports only the triple churning encryption mode.
Rogue ONT state	Whether the optical network unit (ONT) is a rogue ONT. The value is Yes or No.
Port role	Role of the EPON interface. • Work: working port • Protect: protecting port
Active state	Active/standby status of the EPON interface.
LLID	Logical link identifier (LLID) of the EPON interface. • -: indicates that the ONU does not have an LLID because it has not been registered. • Value: indicates the LLID allocated to the ONU by the optical line terminal (OLT).
Register state	Registration status of the ONU. • EXT-OAM-registered: indicates that the ONU has registered with the OLT successfully. • Unregistered: indicates that the ONU has not registered.

Related Topics

5.19.8 epon-mac-address

5.19.9 epon-password

Copyright © Huawei Technologies Co., Ltd.

5.19.7 epon-loid
5.19.6 epon-checkcode

5.19.2 display gpon-info interface pon

Function

The **display gpon-info interface pon** command displays information about a gigabit passive optical network (GPON) interface.

Format

display gpon-info interface pon *interface-number*

Parameters

Parameter	Description	Value
interface-number	Specifies the number of a GPON interface.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

You can use this command to view attributes of a GPON interface, including the optical network unit (ONU) ID, serial number (SN), password, link status, registration status, Physical Layer Operations, Administration and Maintenance (PLOAM) status, port role, and active/standby status.

Example

Display information about GPON interface PON1/0/0.

```
<Huawei> display gpon-info interface pon 1/0/0
-------------------------------------------------------------------------------
 ONU-ID                 : 1
 SN                   : 6877687700111747 (hwhw-00111747)
 Password               : %@%@Hn5wW{:%FRZy7;6lp[NB,#o:%@%@
 Link state           : Up
 Register state         : Registered
 Ploam state            : Operation-State
 Laser switch           : Auto
 OMCI PortID            : 1
 Rogue ONT state        : No
 Port role            : Work
 Active state           : Active
-------------------------------------------------------------------------------
```

 Copyright © Huawei Technologies Co., Ltd.

```
--------------------------------------------------------------------------------
TCONT-INDEX  AllocID  GEM-PortID   Car-Index  Encrypt
--------------------------------------------------------------------------------
      0       0          -          -         -
      1     256          -          -         -
--------------------------------------------------------------------------------
```

Table 5-66 Description of the display gpon-info interface pon command output

Item	Description
ONU-ID	ID of the ONU where the GPON interface is located. An ONU ID is a unique identifier allocated by the optical line terminal (OLT)
SN	SN of the ONU. The SN of each ONU is a globally unique string of 13 characters. The first four characters represent the manufacturer. The SN of a Huawei ONU starts with hwhw.
Password	Password that the GPON interface uses for authentication.
Link state	Link status of the GPON interface. The value is Up or Down.
Register state	Registration status of the ONU. • Registered: indicates that the ONU has registered with the OLT successfully. • Unregistered: indicates that the ONU has not registered.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
PLOAM state	PLOAM status of the GPON interface. • Initial-State: indicates that the ONU was just powered on or detected a loss of signal (LOS) or loss of frame (LOF). • Standby-State: indicates that the ONU has received downstream frames and is waiting for network parameters. • Serial-Number-State: indicates that the ONU is reporting its SN to the OLT. • Ranging-State: indicates that the OLT is measuring the distance to the ONU. • Operation-State: indicates that the ONU is working. • POPUP-State: indicates that the ONU detects a LOS or LOF. • Emergency-Stop-State: indicates that the ONU was stopped due an emergency.
Laser switch	Optical signal status on the GPON interface. • Auto: indicates that the GPON interface is in auto state. • Up: indicates that the GPON interface continuously generates optical signals. • Off: indicates that the GPON interface does not generate optical signals.
OMCI portID	The GPON encapsulation mode (GEM) port ID used by the ONT Management Control Interface (OMCI). ONT stands for the optical network terminal.
Rogue ONT state	Whether the ONT is a rogue ONT. The value is Yes or No.
Port role	Role of the GPON interface. • Work: working port • Protect: protecting port
Active state	Active/standby status of the GPON interface.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
TCONT-INDEX	T-CONT index used by the ONU.
AllocID	ID allocated by the OLT to identify a T-CONT.
GEM-PortID	GEM port ID that identifies a service flow.
Car-Index	Index of CAR applied to a GEM port.
Encrypt	Status of the encryption function on the GEM port. • On: indicates that encryption is enabled on the GEM port. • Off: indicates that encryption is disabled on the GEM port.

Related Topics

5.19.10 gpon-password

5.19.3 display pon-statistic interface pon

Function

The **display pon-statistic interface pon** command displays traffic statistics on a passive optical network (PON) interface.

Format

display pon-statistic interface pon *interface-number*

Parameters

Parameter	Description	Value
interface-number	Specifies the number of a PON interface.	-

Views

All views

Default Level

1: Monitoring level

Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

Usage Scenario

The **display pon-statistic interface pon** command displays traffic statistics on a PON interface, including the number of frames received, number of bytes received, numbers of uplink and downlink Ethernet frames, and real-time uplink and downlink traffic volumes.

To view the traffic statistics collected in a certain period, run the **reset pon-statistic interface pon** command to clear existing traffic statistics, and then run the **display pon-statistic interface pon** command.

NOTE

EPON and GPON interfaces use different packet encapsulation modes; therefore, the command outputs for EPON and GPON interfaces are different.

Example

Display traffic statistics on EPON interface PON1/0/0.

```
<Huawei> display pon-statistic interface pon 1/0/0
-------------------------------------------------------------------
 Received frames               : 58032
 Received bytes                : 2389
 Received unicast frames       : 0
 Received multicast frames     : 37
 Received broadcast frames     : 0
 Received 64-byte frames       : 33
 Received 65~127-byte frames   : 4
 Received 128~255-byte frames  : 0
 Received 256~511-byte frames  : 0
 Received 512~1023-byte frames : 0
 Received 1024~1518-byte frames : 0
 Received over 1518-byte frames : 0
 Received undersize frames     : 0
 Received oversize frames      : 0
 Received CRC error frames     : 0
 Sent frames                   : 58005
 Sent bytes                    : 2523
 Sent unicast frames           : 0
 Sent multicast frames         : 37
 Sent broadcast frames         : 0
 Sent 64-byte frames           : 32
 Sent 65~127-byte frames       : 5
 Sent 128~255-byte frames      : 0
 Sent 256~511-byte frames      : 0
 Sent 512~1023-byte frames     : 0
 Sent 1024~1518-byte frames    : 0
 Sent over 1518-byte frames    : 0
 PON Rx FEC error frames       : 0
 PON Tx MPCP frames            : 57968
 PON Rx MPCP frames            : 57995
 PON Tx OAM frames             : 37
 PON Rx OAM frames             : 37
 Up traffic (kbps)             : 0
 Down traffic (kbps)           : 0
-------------------------------------------------------------------
```


Copyright © Huawei Technologies Co., Ltd.

Table 5-67 Description of the display pon-statistic interface pon command output (EPON interface)

Item	Description
Received frames	Number of frames received by the EPON interface.
Received bytes	Number of bytes received by the EPON interface.
Received unicast frames	Number of unicast frames received by the EPON interface.
Received multicast frames	Number of multicast frames received by the EPON interface.
Received broadcast frames	Number of broadcast frames received by the EPON interface.
Received 64-byte frames	Number of 64-byte frames received by the EPON interface.
Received 65~127-byte frames	Number of frames of 65 to 127 bytes received by the EPON interface.
Received 128~255-byte frames	Number of frames of 128 to 255 bytes received by the EPON interface.
Received 256~511-byte frames	Number of frames of 256 to 511 bytes received by the EPON interface.
Received 512~1023-byte frames	Number of frames of 512 to 1023 bytes received by the EPON interface.
Received 1024~1518-byte frames	Number of frames of 1024 to 1518 bytes received by the EPON interface.
Received over 1518-byte frames	Number of frames of more than 1518 bytes received by the EPON interface.
Received undersize frames	Number of undersized frames received by the EPON interface.
Received oversize frames	Number of oversized frames received by the EPON interface.
Received CRC error frames	Number of frames with cyclic redundancy check (CRC) errors received by the EPON interface.
Sent frames	Number of frames sent by the EPON interface.
Sent bytes	Number of bytes sent by the EPON interface.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
Sent unicast frames	Number of unicast frames sent by the EPON interface.
Sent multicast frames	Number of multicast frames sent by the EPON interface.
Sent broadcast frames	Number of broadcast frames sent by the EPON interface.
Sent 64-byte frames	Number of 64-byte frames sent by the EPON interface.
Sent 65~127-byte frames	Number of frames of 65 to 127 bytes sent by the EPON interface.
Sent 128~255-byte frames	Number of frames of 128 to 255 bytes sent by the EPON interface.
Sent 256~511-byte frames	Number of frames of 256 to 511 bytes sent by the EPON interface.
Sent 512~1023-byte frames	Number of frames of 512 to 1023 bytes sent by the EPON interface.
Sent 1024~1518-byte frames	Number of frames of 1024 to 1518 bytes sent by the EPON interface.
Sent over 1518-byte frames	Number of frames of more than 1518 bytes sent by the EPON interface.
PON Rx FEC error frames	Number of frames with forward error correction (FEC) errors received by the EPON interface.
PON Tx MPCP frames	Number of Multipoint Control Protocol (MPCP) frames sent by the EPON interface.
PON Rx MPCP frames	Number of MPCP frames received by the EPON interface.
PON Tx OAM frames	Number of OAM frames sent by the EPON interface.
PON Rx OAM frames	Number of OAM frames received by the EPON interface.
Up traffic	Real-time upstream traffic rate on the EPON interface.
Down traffic	Real-time downstream traffic rate on the EPON interface.

Display traffic statistics on GPON interface PON1/0/0.

 Copyright © Huawei Technologies Co., Ltd.

```
<Huawei> display pon-statistic interface pon 1/0/0
-------------------------------------------------------------------
 Up OMCI cells statistics                : 0
 Down OMCI cells statistics              : 0
 Up Ethernet frames statistics           : 224
 Down Ethernet frames statistics         : 134
 Up PLOAM messages statistics            : 0
 Down PLOAM messages statistics          : 12
-------------------------------------------------------------------
```

Table 5-68 Description of the display pon-statistic interface pon command output (GPON interface)

Item	Description
Up OMCI Cells statistics	Number of upstream ONT Management Control Interface (OMCI) cells. ONT stands for the optical network terminal.
Down OMCI Cells statistics	Number of downstream OMCI cells.
Up Ethernet frames statistics	Number of upstream Ethernet frames.
Down Ethernet frames statistics	Number of downstream Ethernet frames.
Up PLOAM Messages statistics	Number of upstream Physical Layer Operations, Administration and Maintenance (PLOAM) messages. PLOAM messages are used for maintain optical network units (ONUs).
Down PLOAM Messages statistics	Number of downstream PLOAM messages.

Related Topics

5.19.19 reset pon-statistic interface pon

5.19.4 display pon-transceiver interface pon

Function

The **display pon-transceiver interface pon** command displays information about the optical module on a passive optical network (PON) interface.

Format

display pon-transceiver interface pon *interface-number*

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
interface-number	Specifies the number of a PON interface.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

The **display pon-transceiver interface pon** command output includes the optical wavelength, identifier, transmission distance, version, bias current, voltage, and various alarm thresholds of an optical module.

Example

Display information about the optical module on PON1/0/0.

```
<Huawei> display pon-transceiver interface pon 1/0/0
  ----------------------------------------------------------------------------
  Optical Module status         : Online
  Wave Length(nm)               : 1310
  Identifier                  : SFP
  Ext.Identifier              : GBIC/SFP function is defined by serial ID only
  Connector                    : SC
  Encoding                    : NRZ
  BR,Nominal(100Mbps)           : 13
  Length(9um)(km)               : 20.0
  Length(50um)                 : Not support
  Length(62.5um)               : Not support
  Length(Copper)               : Not support
  Cc_base                     : 0x1a
  CC_EXT                      : 0xf3
  BR,max                      : Unspecified
  BR,min                      : Unspecified
  SFF-8472 Compliance           : Invalid
  Options                     : TX_DISABLE,and disables the serial output
                            : TX_FAULT
                            : LOS(signal inverted from standard definition)
  Vendor Rev                    : Unspecified
  Vendor PN                     : HPSP2120
  Vendor SN                     : 030KMF1107501261
  Vendor OUI                    : 000000
  Manufactured                   : 10-07-08
  Vendor name                   : HUAWEI
  RX power(dBm)                  : -11.82
  TX power(dBm)                  : 2.49
  Temperature(C)                : 53.87
  TX Bias current(mA)            : 10.54
  Supply Voltage(V)             : 3.25
  RX power Alarm Threshold(dBm) : [-,-]
  TX power Alarm Threshold(dBm) : [-,-]
  Temperature Alarm Threshold(C): [-,-]
```


Copyright © Huawei Technologies Co., Ltd.

```
TX Bias Alarm Threshold(mA)   : [10,20]
Voltage Alarm Threshold(V)    : [-,-]
-------------------------------------------------------------------------------
```

Table 5-69 Description of the display pon-transceiver interface pon command output

Optical Module status	Description
Optical Module status	Status of the optical module. The value is Online or Offline.
Wave Length(nm)	Optical wavelength of the optical module.
Identifier	Identifier of the optical module. ● Unknown ● GBIC ● Module/connector soldered to motherboard ● SFP
Ext.Identifier	Extended identifier of the optical module. ● Not specified or not compliant with a defined MOD_DEF. ● GBIC is compliant with MOD_DEF 1 ● GBIC is compliant with MOD_DEF 2 ● GBIC is compliant with MOD_DEF 3 ● GBIC/SFP function is defined by serial ID only ● GBIC is compliant with MOD_DEF 5 ● GBIC is compliant with MOD_DEF 6 ● GBIC is compliant with MOD_DEF 7

Copyright © Huawei Technologies Co., Ltd.

Optical Module status	Description
Connector	Connector type used by the optical module. • Unknown • SC • Fibre Channel Style 1 copper connector • Fibre Channel Style 2 copper connector • BNC/TNC • Fibre Channel coaxial headers • FiberJack • LC • MT-RJ • MU • SG • Optical pigtail • HSSDC II • Copper Pigtail
Encoding	Encoding format used by the optical module. • Unspecified • 8B10B • 4B5B • NRZ • Manchester • SONET Scrambled
BR,Nominal(100Mbps)	Default bit rate.
Length(9um)(km)	Transmission distance of a 9/125 μm optical fiber.
Length(50um)	Transmission distance of a 50/125 μm optical fiber.
Length(62.5um)	Transmission distance of a 62.5/125 μm optical fiber.
Length(Copper)	Transmission distance of a copper network cable.
Cc_base	Check code for the basic ID.
CC_EXT	Check code for the extended ID.
BR,max	Maximum bit rate.

Copyright © Huawei Technologies Co., Ltd.

Optical Module status	Description
BR,min	Minimum bit rate.
SFF-8472 Compliance	Whether the optical module complies with SFF-8472.
Options	Options.
Vendor Rev	Version of the optical module.
Vendor PN	Product number used by the manufacturer.
Vendor SN	Product number used by the manufacturer.
Vendor OUI	Organizationally Unique Identifier (OUI) of the manufacturer.
Manufactured	Production date of the optical module.
Vendor name	Name of the manufacturer.
RX power(dBm)	Receiving optical power.
TX power(dBm)	Sending optical power.
Temperature(C)	Operating temperature.
TX Bias current(mA)	Bias current of the optical module.
Supply Voltage(V)	Voltage provided for the optical module.
RX power Alarm Threshold(dBm)	Alarm threshold of the receiving optical power. To set the alarm threshold, run the **optical-module threshold rx-power** command.
TX power Alarm Threshold(dBm)	Alarm threshold of the transmitting optical power. To set the alarm threshold, run the **optical-module threshold tx-power** command.
Temperature Alarm Threshold(C)	Alarm threshold of the operating temperature. To set the alarm threshold, run the **optical-module threshold temperature** command.
TX Bias Alarm Threshold(mA)	Alarm threshold of the bias current. To set the alarm threshold, run the **optical-module threshold bias** command.
Voltage Alarm Threshold(V)	Alarm threshold of the voltage. To set the alarm threshold, run the **optical-module threshold voltage** command.

 Copyright © Huawei Technologies Co., Ltd.

Related Topics

5.19.11 interface pon
5.19.14 optical-module threshold rx-power
5.19.16 optical-module threshold tx-power
5.19.13 optical-module threshold bias
5.19.17 optical-module threshold voltage
5.19.15 optical-module threshold temperature

5.19.5 epon compatibility

Function

The **epon compatibility** command configures the compatibility mode of an EPON interface.

The **undo epon compatibility** command restores the default setting.

By default, the compatibility mode of an EPON interface is not configured.

Format

epon compatibility dba

undo epon compatibility

Parameters

Parameter	Description	Value
dba	Configures an EPON interface to work in dynamic bandwidth assignment (DBA) mode.	-

Views

PON interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

If the device connects to an optical line terminal (OLT) through an EPON interface and the remote OLT sends non-standard DBA packets, you can run this command

Copyright © Huawei Technologies Co., Ltd.

to set the compatibility mode of the EPON interface to DBA so that the device can process non-standard DBA packets from the remote OLT and transmit services.

Prerequisites

A PON interface has been configured to work in EPON mode.

Precautions

After running the **epon compatibility** command on a device, restart the device to make the configuration take effect.

Example

Set the compatibility mode of an EPON interface to DBA.

```
<Huawei> system-view
[Huawei] interface pon 1/0/0
[Huawei-Pon1/0/0] port mode epon
 After you set the work mode of port to a fixed type, you need to interrupt the
service of the up-link port to change the work mode.
 Are you sure to proceed? (y/n)[n]:y
[Huawei-Pon1/0/0] epon compatibility dba
```

Related Topics

5.19.11 interface pon

5.19.18 port mode

5.19.6 epon-checkcode

Function

The **epon-checkcode** command configures an authentication check code on an Ethernet passive optical network (EPON) interface.

Format

epon-checkcode *checkcode*

Parameters

Parameter	Description	Value
checkcode	Specifies a check code used for authentication.	The value is a string of 1 to 12 characters without spaces.

Views

PON interface view

Default Level

2: Configuration level

Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

Usage Scenario

An optical line terminal (OLT) authenticates validity and identity of each optical network unit (ONU) to prevent unauthorized ONUs.

The **epon-checkcode** command configures logical identifier authentication: The OLT authenticates an ONU by checking the logical identifier (LOID) and check code of the ONU. You can configure the OLT to check only the LOID, or check both the LOID and check code. Logical identifier authentication is applicable to networks requiring flexible access.

NOTE

When logical identifier authentication is used, run the **epon-checkcode** command to configure an LOID for the ONU.

Configuration Impact

If you run the **epon-checkcode** command multiple times in the same view, only the latest configuration takes effect.

Follow-up Procedure

Run the **epon-loid** command to configure an LOID for the ONU when the OLT is configured to check both the LOID and check code.

Precautions

All the authentication parameters are pre-configured on the OLT and cannot be modified on the ONU. Otherwise, the ONU cannot be authenticated.

Example

Set the authentication check code to eponcode on EPON interface PON1/0/0.

```
<Huawei> system-view
[Huawei] interface pon 1/0/0
[Huawei-Pon1/0/0] port mode epon
 After you set the work mode of port to a fixed type, you need to interrupt the
service of the up-link port to change the work mode. Are you sure to proceed? (
y/n)[n]:y
[Huawei-Pon1/0/0] epon-checkcode eponcode
```

Related Topics

5.19.11 interface pon

5.19.18 port mode

5.19.7 epon-loid

5.19.1 display epon-info interface pon

5.19.7 epon-loid

Function

Using the **epon-loid** command, you can configure the authentication logical identifier (LOID) on an Ethernet passive optical network (EPON) interface.

 Copyright © Huawei Technologies Co., Ltd.

Format

epon-loid *loid*

Parameters

Parameter	Description	Value
loid	Specifies the LOID used for authentication.	The value is a string of 1 to 24 characters without spaces.

Views

PON interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

An optical line terminal (OLT) authenticates validity and identity of each optical network unit (ONU) to prevent unauthorized ONUs.

The **epon-loid** command configures logical identifier authentication: The OLT authenticates an ONU by checking the logical identifier (LOID) and check code of the ONU. You can configure the OLT to check only the LOID or check both the LOID and check code. Logical identifier authentication is applicable to networks requiring flexible access.

NOTE

When logical identifier authentication is used, run the **epon-loid** command to configure an LOID for the ONU no matter whether the OLT checks only the LOID or checks both the LOID and check code.

Follow-up Procedure

Run the **epon-checkcode** command to configure a check code for the device if the OLT checks both the LOID and check code in authentication.

Precautions

If you run the **epon-loid** command multiple times in the same view, only the latest configuration takes effect.

All the authentication parameters are pre-configured on the OLT and cannot be modified on the ONU. Otherwise, the ONU cannot be authenticated.

Example

Set the LOID to hwloid on EPON interface PON1/0/0.

 Copyright © Huawei Technologies Co., Ltd.

```
<Huawei> system-view
[Huawei] interface pon 1/0/0
[Huawei-Pon1/0/0] port mode epon
 After you set the work mode of port to a fixed type, you need to interrupt the
service of the up-link port to change the work mode. Are you sure to proceed? (
y/n)[n]:y
[Huawei-Pon1/0/0] epon-loid hwloid
```

Related Topics

5.19.11 interface pon

5.19.18 port mode

5.19.6 epon-checkcode

5.19.1 display epon-info interface pon

5.19.8 epon-mac-address

Function

Using the **epon-mac-address** command, you can configure the authentication MAC address on an Ethernet passive optical network (EPON) interface.

Format

epon-mac-address *mac-address*

Parameters

Parameter	Description	Value
mac-address	Specifies the MAC address used for authentication.	The value is in the H-H-H format. H is a hexadecimal number of 4 digits.

Views

PON interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

An optical line terminal (OLT) authenticates validity and identity of each optical network unit (ONU) to prevent unauthorized ONUs.

When the OLT uses MAC address authentication, run the **epon-mac-address** command to configure a MAC address for the device. MAC address authentication is applicable to networks requiring high security.

Copyright © Huawei Technologies Co., Ltd.

Precautions

All the authentication parameters are pre-configured on the OLT and cannot be modified on the ONU. Otherwise, the ONU cannot be authenticated.

NOTE

The MAC address cannot be changed after the ONU passes the authentication.

Example

Set the configuration MAC address to 0018-8232-6518 on EPON interface PON1/0/0.

```
<Huawei> system-view
[Huawei] interface pon 1/0/0
[Huawei-Pon1/0/0] port mode epon
 After you set the work mode of port to a fixed type, you need to interrupt the
service of the up-link port to change the work mode. Are you sure to proceed? (
y/n)[n]:y
[Huawei-Pon1/0/0] epon-mac-address 0018-8232-6518
```

Related Topics

5.19.11 interface pon

5.19.18 port mode

5.19.1 display epon-info interface pon

5.19.9 epon-password

Function

Using the **epon-password** command, you can configure the authentication password on an Ethernet passive optical network (EPON) interface.

Format

epon-password cipher *password*

Parameters

Parameter	Description	Value
password	Specifies the password used for authentication.	The value is a string of 1 to 68 case-sensitive characters without spaces. • The length of a plaintext password ranges from 1 to 32. • The length of a ciphertext password ranges from 32 to 68.

Copyright © Huawei Technologies Co., Ltd.

Views

PON interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

An optical line terminal (OLT) authenticates validity and identity of each optical network unit (ONU) to prevent unauthorized ONUs.

When the OLT uses password authentication, run the **epon-password** command to configure a password for the switch. Password authentication is applicable to networks requiring flexible access.

NOTE

Password authentication is a Huawei proprietary authentication mode. When this mode is used, the OLT must be a Huawei device.

Precautions

If you run the **epon-password** command multiple times in the same view, only the latest configuration takes effect.

All the authentication parameters are pre-configured on the OLT and cannot be modified on the ONU. Otherwise, the ONU cannot be authenticated.

Example

Set the authentication password to hwpwd on EPON interface PON1/0/0.

```
<Huawei> system-view
[Huawei] interface pon 1/0/0
[Huawei-Pon1/0/0] port mode epon
 After you set the work mode of port to a fixed type, you need to interrupt the
service of the up-link port to change the work mode. Are you sure to proceed? (
y/n)[n]:y
[Huawei-Pon1/0/0] epon-password cipher hwpwd
```

Related Topics

5.19.11 interface pon

5.19.18 port mode

5.19.1 display epon-info interface pon

5.19.10 gpon-password

Function

Using the **gpon-password** command, you can configure the authentication password on a gigabit passive optical network (GPON) interface.

 Copyright © Huawei Technologies Co., Ltd.

Format

gpon-password cipher *password*

Parameters

Parameter	Description	Value
password	Specifies the password used for authentication.	The value is a string of 1 to 48 case-sensitive characters without spaces. • The length of a plaintext password ranges from 1 to 10. • The length of a ciphertext password is 48.

Views

PON interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

An optical line terminal (OLT) authenticates validity and identity of each optical network unit (ONU) to prevent unauthorized ONUs. A GPON system supports the following ONU authentication modes:

The device supports the SN authentication mode by default.

Table 5-70 lists the comparison of ONU authentication modes in a GPON system.

 Copyright © Huawei Technologies Co., Ltd.

Table 5-70 Comparison of ONU authentication modes in a GPON system

Authentication Mode	Description	Advantage	Disadvantage	Usage Scenario
SN authentication	The OLT authenticates an ONU by checking the SN of the ONU. The SN of each ONU is a globally unique string of 13 characters. The first four characters represent the manufacturer. The SN of a Huawei ONU starts with hwhw.	This mode does not require any manual configuration and has a high reliability.	When an ONU fails and needs to be replaced by a new one, the SN of the new ONU must be added to the OLT, so this mode is not flexible.	It is applicable to all scenarios because the device supports this mode by default.

 Copyright © Huawei Technologies Co., Ltd.

Authentication Mode	Description	Advantage	Disadvantage	Usage Scenario
Password authentication	The OLT authenticates an ONU by checking whether the password sent by the ONU is the same as that configured locally.	It is simple to configure and you do not need to configure new passwords when users change their physical locations. This mode implements flexible access.	When two ONUs use the same password, the OLT allows the one that passes the authentication earlier to go online. Therefore, if an unauthorized ONU has gone online by using the password of an authorized ONU, the authorized ONU cannot go online.	It is applicable to networks requiring flexible access.

A GPON system supports the following ONU authentication modes: only by serial number (SN), only by password, or by SN and password. When a GPON system authenticates the ONU by checking the password or checking the SN and password, you must run this command to configure a password for the GPON.

Configuration Impact

If you run the **gpon-password** command multiple times in the same view, only the latest configuration takes effect.

Precautions

All the authentication parameters are pre-configured on the OLT and cannot be modified on the ONU. Otherwise, the ONU cannot be authenticated.

Example

Set the authentication password to huawei on GPON interface PON1/0/0.

```
<Huawei> system-view
[Huawei] interface pon 1/0/0
[Huawei-Pon1/0/0] port mode gpon
 After you set the work mode of port to a fixed type, you need to interrupt the
service of the up-link port to change the work mode. Are you sure to proceed? (
y/n)[n]:y
[Huawei-Pon1/0/0] gpon-password cipher huawei
```

Related Topics

5.19.11 interface pon

5.19.18 port mode

Copyright © Huawei Technologies Co., Ltd.

5.19.2 display gpon-info interface pon

5.19.11 interface pon

Function

Using the **interface pon** command, you can enter the passive optical network (PON) interface view and create a PON sub-interface.

Format

interface pon *interface-number*

interface pon *interface-number.subinterface-number*

Parameters

Parameter	Description	Value
interface-number	Specifies the number of a PON interface. The value is in slot ID/subcard ID/interface sequence number format.	Values of the fields are: • The subcard ID is 0. • The interface sequence number is 0 or 1. **NOTE** • When the sequence number of a PON interface is 0, services are configured on this interface. • When the sequence number of a PON interface is 1, this interface functions as a backup interface. In most cases, no service is configured on this interface.
subinterface-number	Specifies the number of a PON sub-interface.	The value is an integer that ranges from 1 to 4096.

Views

System view

Default Level

2: Configuration level

 Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

To configure attributes of a PON interface or a PON sub-interface, you need to use this command to enter the PON interface view or PON sub-interface view.

Example

Enter the view of PON1/0/0.

```
<Huawei> system-view
[Huawei] interface pon 1/0/0
[Huawei-Pon1/0/0]
```

Create and enter PON1/0/0.1

```
<Huawei> system-view
[Huawei] interface pon 1/0/0.1
[Huawei-Pon1/0/0.1]
```

Related Topics

5.19.4 display pon-transceiver interface pon

5.19.12 laser

Function

Using the **laser** command, you can configure the laser working mode of the optical module on a passive optical network (PON) interface.

The default laser working mode is **auto**.

Format

laser { **auto** | **off** | **on** [*time-value*] }

Parameters

Parameter	Description	Value
auto	Indicates that the optical module generates optical signals when data needs to be transmitted and stops generating optical signals when no data needs to be transmitted.	-
off	Indicates that the optical module does not generate optical signals.	-
on	Indicates that the optical module continuously generates optical signals.	-

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
time-value	Specifies the period during which the optical module generates optical signals.	The value is an integer that ranges from 1 to 60, in seconds. The default value is 20.

Views

PON interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

- The auto mode is used when a PON interface needs to transmit data.
- The off mode is used when a PON interface does not need to transmit data in a long time.
- The on mode is used when the transmit power of the optical module needs to be tested.

Precautions

- If you run the **laser** command multiple times in the same view, only the latest configuration takes effect.
- Before setting the laser working mode on a PON interface to off, ensure that the PON interface does not need to transmit any service data. Otherwise, services on the interface will be interrupted.
- When setting the laser working mode to on, you can set the *time-value* parameter. The optical module generates optical signals within the specified period. After this period, the optical module works in auto mode. If this parameter is not set, the optical module starts to work in auto mode after 20 seconds.
- When a PON interface works in GPON mode, the laser working mode cannot be directly changed from off to on. You must change the laser working mode to auto, and then change it to on.

Example

Configure the optical module on PON1/0/0 to continuously generate optical modules for 30 seconds.

```
<Huawei> system-view
[Huawei] interface pon 1/0/0
[Huawei-Pon1/0/0] laser on 30
```

Related Topics

5.19.11 interface pon

 Copyright © Huawei Technologies Co., Ltd.

5.19.4 display pon-transceiver interface pon

5.19.13 optical-module threshold bias

Function

Using the **optical-module threshold bias** command, you can set the lower and upper alarm thresholds of the bias current for the optical module on a passive optical network (PON) interface.

Format

optical-module threshold bias { **lower-limit** *lower-limit* | **upper-limit** *upper-limit* }*

Parameters

Parameter	Description	Value
lower-limit *lower-limit*	Specifies the lower alarm threshold of the bias current.	The value is an integer that ranges from 0 mA to 10000 mA. The recommended value is 2.
upper-limit *upper-limit*	Specifies the upper alarm threshold of the bias current.	The value is an integer that ranges from 0 mA to 10000 mA. The recommended value is 70.

Views

PON interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

An optical module can work properly when the bias current is in the range of 0 mA to 10000 mA. If the bias current is out of this range, the optical module may fail to receive optical signals. As a result, the optical network unit (ONU) is forced offline and services on the ONU are interrupted. The **optical-module threshold bias** command sets the lower and upper alarm thresholds of the bias current. When the bias current is out of the specified range, the ONU sends a trap to the NMS.

Precautions

 Copyright © Huawei Technologies Co., Ltd.

If you run the **optical-module threshold bias** command multiple times in the same view, only the latest configuration takes effect.

The lower alarm threshold must be smaller than or equal to the upper alarm threshold.

Example

Set the lower alarm threshold of the bias current to 5 mA and the upper alarm threshold to 50 mA.

```
<Huawei> system-view
[Huawei] interface pon 1/0/0
[Huawei-Pon1/0/0] optical-module threshold bias lower-limit 5 upper-limit 50
```

Related Topics

5.19.11 interface pon

5.19.4 display pon-transceiver interface pon

5.19.14 optical-module threshold rx-power

Function

Using the **optical-module threshold rx-power** command, you can set the lower and upper alarm thresholds of the receiving optical power for the optical module on a passive optical network (PON) interface.

Format

optical-module threshold rx-power { **lower-limit** *lower-limit* | **upper-limit** *upper-limit* }*

Parameters

Parameter	Description	Value
lower-limit	Specifies the lower alarm threshold of the receiving optical power.	The value is a floating point number, accurate to the second decimal place. The value ranges from -99.00 dBm to 100.00 dBm. The recommended value is -35.00.
upper-limit	Specifies the upper alarm threshold of the receiving optical power.	The value is a floating point number, accurate to the second decimal place. The value ranges from -99.00 dBm to 100.00 dBm. The recommended value is 1.00.

Copyright © Huawei Technologies Co., Ltd.

Views

PON interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

An optical module can work properly when the receiving optical power is in the range of -99.00 dBm to 100.00 dBm. If the receiving optical power is out of this range, the optical module may fail to receive optical signals. As a result, the optical network unit (ONU) is forced offline and services on the ONU are interrupted. The **optical-module threshold rx-power** command sets the lower and upper alarm thresholds of the receiving optical power. When the receiving optical power is out of the specified range, the ONU sends a trap to the NMS.

Precautions

If you run the **optical-module threshold rx-power** command multiple times in the same view, only the latest configuration takes effect.

The lower alarm threshold must be smaller than or equal to the upper alarm threshold.

Example

Set the lower alarm threshold of the receiving optical power to -25 dBm and set the upper alarm threshold to 50 dBm.

```
<Huawei> system-view
[Huawei] interface pon 1/0/0
[Huawei-Pon1/0/0] optical-module threshold rx-power lower-limit -25 upper-limit 50
```

Related Topics

5.19.11 interface pon

5.19.4 display pon-transceiver interface pon

5.19.15 optical-module threshold temperature

Function

The **optical-module threshold temperature** command sets the lower and upper alarm thresholds of the temperature for the optical module on a passive optical network (PON) interface.

Format

optical-module threshold temperature { **lower-limit** *lower-limit* | **upper-limit** *upper-limit* }*

 Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
lower-limit	Specifies the lower alarm threshold of the temperature.	The value is a floating point number, accurate to the second decimal place. The value ranges from -99.00ºC to 300.00ºC. The recommended value is -10.
upper-limit	Specifies the upper alarm threshold of the temperature.	The value is a floating point number, accurate to the second decimal place. The value ranges from -99.00ºC to 300.00ºC. The recommended value is 100.

Views

PON interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

An optical module can work properly when the temperature is in the range of -99.00ºC to 300.00ºC. If the temperature is out of this range, the optical module may fail to receive optical signals. As a result, the optical network unit (ONU) is forced offline and services on the ONU are interrupted. The **optical-module threshold temperature** command sets the lower and upper alarm thresholds of the temperature. When the temperature is out of the specified range, the ONU sends a trap to the NMS.

Precautions

If you run the **optical-module threshold temperature** command multiple times in the same view, only the latest configuration takes effect.

The lower alarm threshold must be smaller than or equal to the upper alarm threshold.

Example

Set the lower alarm threshold of the temperature to 5ºC and the upper alarm threshold to 25ºC.

 Copyright © Huawei Technologies Co., Ltd.

```
<Huawei> system-view
[Huawei] interface pon 1/0/0
[Huawei-Pon1/0/0] optical-module threshold temperature lower-limit 5 upper-limit 25
```

Related Topics

5.19.11 interface pon

5.19.4 display pon-transceiver interface pon

5.19.16 optical-module threshold tx-power

Function

Using the **optical-module threshold tx-power** command, you can set the lower and upper alarm thresholds of the transmitting optical power for the optical module on a passive optical network (PON) interface.

Format

optical-module threshold tx-power { **lower-limit** *lower-limit* | **upper-limit** *upper-limit* }*

Parameters

Parameter	Description	Value
lower-limit	Specifies the lower threshold of the transmitting optical power.	The value is a floating point number, accurate to the second decimal place. The value ranges from -99.00 dBm to 100.00 dBm. The recommended value is -1.00.
upper-limit	Specifies the upper threshold of the transmitting optical power.	The value is a floating point number, accurate to the second decimal place. The value ranges from -99.00 dBm to 100.00 dBm. The recommended value is 7.00.

Views

PON interface view

Default Level

2: Configuration level

Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

Usage Scenario

An optical module can work properly when the transmitting optical power is in the range of -99.00 dBm to 100.00 dBm. If the transmitting optical power is out of this range, the optical module may fail to receive optical signals. As a result, the optical network unit (ONU) is forced offline and services on the ONU are interrupted. The **optical-module threshold tx-power** command sets the lower and upper alarm thresholds of the transmitting optical power. When the transmitting optical power is out of the specified range, the ONU sends a trap to the NMS.

Precautions

If you run the **optical-module threshold tx-power** command multiple times in the same view, only the latest configuration takes effect.

The lower alarm threshold must be smaller than or equal to the upper alarm threshold.

Example

Set the lower alarm threshold of the transmitting optical power to -25 dBm and set the upper alarm threshold to 50 dBm.

```
<Huawei> system-view
[Huawei] interface pon 1/0/0
[Huawei-Pon1/0/0] optical-module threshold tx-power lower-limit -25 upper-limit 50
```

Related Topics

5.19.11 interface pon

5.19.4 display pon-transceiver interface pon

5.19.17 optical-module threshold voltage

Function

Using the **optical-module threshold voltage** command, you can set the lower and upper alarm thresholds of the voltage for the optical module on a passive optical network (PON) interface.

Format

optical-module threshold voltage { **lower-limit** *lower-limit* | **upper-limit** *upper-limit* }*

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
lower-limit	Specifies the lower alarm threshold of the voltage.	The value is a floating point number, accurate to the second decimal place. The value ranges from 0 V to 100.00 V. The recommended value is 2.97.
upper-limit	Specifies the upper alarm threshold of the voltage.	The value is a floating point number, accurate to the second decimal place. The value ranges from 0 V to 100.00 V. The recommended value is 3.63.

Views

PON interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

An optical module can work properly when the voltage is in the range of 0 V to 100.00 V. If the voltage is out of this range, the optical module may fail to receive optical signals. As a result, the optical network unit (ONU) is forced offline and services on the ONU are interrupted. The **optical-module threshold voltage** command sets the lower and upper alarm thresholds of the voltage. When the voltage is out of the specified range, the ONU sends a trap to the NMS.

Precautions

If you run the **optical-module threshold voltage** command multiple times in the same view, only the latest configuration takes effect.

The lower alarm threshold must be smaller than or equal to the upper alarm threshold.

Example

Set the lower alarm threshold of the voltage to 5 V and the upper alarm threshold to 25 V.

```
<Huawei> system-view
[Huawei] interface pon 1/0/0
[Huawei-Pon1/0/0] optical-module threshold voltage lower-limit 5 upper-limit 25
```

 Copyright © Huawei Technologies Co., Ltd.

Related Topics

5.19.11 interface pon

5.19.4 display pon-transceiver interface pon

5.19.18 port mode

Function

Using the **port mode** command, you can configure the working mode of an Ethernet passive optical network (PON) interface.

By default, a PON interface works in auto-sensing mode.

Format

port mode { **adapt** | **gpon** | **epon** }

Parameters

Parameter	Description	Value
adapt	Indicates that the PON interface automatically determines the working mode according to the received optical signals. **NOTE** In auto-negotiation mode, the PON interface of the device can work in EPON or GPON mode automatically according to the received optical signal. You are advised to configure a PON interface to work in auto-negotiation mode. To trigger another negotiation after a successful negotiation, reset the PON board. For example, if a PON interface of the device has automatically negotiated to work in EPON mode, you need to reset the PON board so that this interface can automatically negotiate to work in GPON mode when this interface connects to an OLT's PON interface that works in GPON mode.	-

Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
gpon	Indicates that the PON interface works in gigabit PON (GPON) mode.	-
epon	Indicates that the PON interface works in Ethernet PON (EPON) mode.	-

Views

PON interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

When a PON interface of the device is connected to an optical line terminal (OLT), the PON interface must work in the same mode as the remote PON interface of the OLT. You can configure the PON interface to work in EPON or GPON mode according to the working mode of the remote PON interface. Alternatively, you can configure the PON interface to work in auto-sensing mode so that it determines the working mode according to the received optical signals.

Precautions

If you run the **port mode** command multiple times in the same view, only the latest configuration takes effect.

If a PON interface is transmitting service data, changing the working mode will interrupt services on the PON interface. Run this command with caution.

A PON interface does not support switching between the EPON and GPON modes. You must change the a PON interface to the auto-negotiation mode, and then switch it to EPON or GPON.

NOTE

The interval between two mode switches cannot be less than 30 seconds. If it is less than 30 seconds, the device will generate incorrect information.

Example

Configure PON1/0/0 to work in GPON mode.

```
<Huawei> system-view
[Huawei] interface pon 1/0/0
[Huawei-Pon1/0/0] port mode gpon
```

 Copyright © Huawei Technologies Co., Ltd.

```
 After you set the work mode of port to a fixed type, you need to interrupt the
service of the up-link port to change the work mode. Are you sure to proceed? (
y/n)[n]:y
```

Related Topics

5.19.11 interface pon

5.19.19 reset pon-statistic interface pon

Function

Using the **reset pon-statistic interface pon** command, you can clear traffic statistics on a passive optical network (PON) interface.

Format

reset pon-statistic interface pon *interface-number*

Parameters

Parameter	Description	Value
interface-number	Specifies the number of a PON interface.	-

Views

User view, System view

Default Level

2: Configuration level

Usage Guidelines

Before collecting traffic statistics on a PON interface in a certain period, you must run the **reset pon-statistic interface pon** command to clear the previous statistics.

Example

Clear traffic statistics on PON1/0/0.

```
<Huawei> system-view
[Huawei] reset pon-statistic interface pon 1/0/0
```

Related Topics

5.19.3 display pon-statistic interface pon

Copyright © Huawei Technologies Co., Ltd.

5.19.20 undo optical-module threshold

Function

Using the **undo optical-module threshold** command, you can remove all configured alarm thresholds for the optical module.

Format

undo optical-module threshold

Parameters

N/A

Views

PON interface view

Default Level

2: Configuration level

Usage Guidelines

To remove all lower and upper alarm thresholds of the bias current, receiving optical power, transmitting optical power, voltage, or temperature are configured, you can use this command. After all configured alarm thresholds of the device are removed, the ONU will not send alarms to network management devices when the bias current, receiving optical power, transmitting optical power, voltage, or temperature is too high or too low.

Example

Remove all configured alarm thresholds.

```
<Huawei> system-view
[Huawei] interface pon 1/0/0
[Huawei-Pon1/0/0] undo optical-module threshold
```

Related Topics

5.19.11 interface pon

5.20 Logical Interface Configuration Commands

Copyright © Huawei Technologies Co., Ltd.

5.20.1 broadcast-limit link

Function

Using the **broadcast-limit link** command, you can set the maximum number of links for sending multicast or broadcast packets supported by a virtual template interface.

Using the **undo broadcast-limit link** command, you can restore the default setting.

By default, the maximum number of links for sending multicast or broadcast packets supported by a virtual template interface is 30.

Format

broadcast-limit link *number*

undo broadcast-limit link

Parameters

Parameter	Description	Value
number	Specifies the maximum number of links for sending multicast or broadcast packets supported by a virtual template interface.	The value ranges from 0 to 128. You are advised to use the default value.

Views

VT interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

If the number of links configured on a virtual template interface is large, system performance deteriorates when multicast or broadcast packets need to be sent over each link. To solve the problem, you can run the **broadcast-limit link** command to set the maximum number of links supported by the virtual template interface.

Precautions

When the number of links exceeds the maximum value, multicast or broadcast packets are discarded.

 Copyright © Huawei Technologies Co., Ltd.

Example

Set the maximum number of links for sending multicast or broadcast packets supported by the virtual template interface 1 to 30.

```
<Huawei> system-view
[Huawei] interface virtual-template 1
[Huawei-Virtual-Template1] broadcast-limit link 30
```

Related Topics

5.20.6 display interface virtual-template

5.20.2 display interface loopback

Function

Using the **display interface loopback** command, you can view the status of a loopback interface.

Format

display interface loopback [*loopback-number*]

Parameters

Parameter	Description	Value
loopback-number	Specifies the number of a loopback interface. If *loopback-number* is not specified, the status of all loopback interfaces is displayed.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

In the scenario where you need to monitor the status of an interface or locate an interface fault, you can use the **display interface loopback** command to collect the statistics on the interface including the status. Through the displayed information, you can collect the traffic statistics and troubleshoot the interface.

Example

Display the status of a specified loopback interface.

```
<Huawei> display interface loopback 6
LoopBack6 current state : UP
Line protocol current state : UP (spoofing)
```

 Copyright © Huawei Technologies Co., Ltd.

```
Description:HUAWEI, AR Series, LoopBack6 Interface
Route Port,The Maximum Transmit Unit is 1500
Internet Address is 10.10.1.1/32
Physical is Loopback
Current system time: 2012-05-28 11:20:08
    Last 300 seconds input rate 0 bits/sec, 0 packets/sec
    Last 300 seconds output rate 0 bits/sec, 0 packets/sec
    Realtime 2 seconds input rate 0 bits/sec, 0 packets/sec
    Realtime 2 seconds output rate 0 bits/sec, 0 packets/sec
    Input: 0 bytes
    Output:0 bytes
    Input bandwidth utilization  :    0%
    Output bandwidth utilization :    0%
```

Table 5-71 Description of the display interface loopback command output

Item	Description
LoopBack6 current state	Physical status of the loopback interface. After a loopback interface is created, the physical status keeps Up.
Line protocol current state	Link layer protocol status of the interface. After a loopback interface is created, the status of the link layer protocol keeps Up.
Description	Description of the interface. Up to 242 case-sensitive characters (including spaces) can be entered. The description helps you to know the functions of the interface.
The Maximum Transmit Unit is	Maximum transmission unit (MTU). The default MTU is 1500 bytes. Packets whose size is greater than the MTU are fragmented before being transmitted. If fragmentation is not allowed, the packets are discarded.
Internet Address is	IP address of the interface.
Physical is Loopback	Information about the link at the physical layer.
Current system time	Current system time. If the system is configured with a time zone and is in the summer time, the time is displayed in the format of YYYY/MM/DD HH:MM:SS UTC±HH:MM DST.
Last 300 seconds input rate Last 300 seconds output rate	Average rates at which the interface sends and receives packets and bytes in the last five minutes. You can run the **set flow-stat interval** command to change the interval at which traffic statistics are collected.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Realtime 2 seconds input rate Realtime 2 seconds output rate	Real-time rates at which the interface sends and receives packets and bytes within 2 seconds. It refers to the interval between two **display** commands that are run on the same interface. The maximum value is the statistical interval displayed in the previous piece of information. This entry is displayed only when information about a logical interface is viewed.
Input	Total number of packets and the total number of bytes received by the interface.
Output	Total number of packets and the total number of bytes sent by the interface.
Input bandwidth utilization	Percentage of the packet receiving to the total bandwidth.
Output bandwidth utilization	Percentage of the packet sending rate to the total bandwidth.

Related Topics

5.20.10 interface loopback

5.20.3 display interface null

Function

Using the **display interface null** command, you can view the status of a null interface.

Format

display interface null [**0**]

Parameters

Parameter	Description	Value
0	Specifies the number of the null interface.	The value can be 0 only.

Views

All views

Default Level

1: Monitoring level

Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

Usage Scenario

The **display interface null** command displays the status of a null interface. The interface status information includes: the physical status, link layer protocol status, description, MTU, IP address, current system time, last time statistics about the null interface are cleared, incoming and outgoing packet rates in bit/s and pps, total numbers of packets and bytes received and sent by the null interface, and percentages of the rates for receiving and sending packets to the total bandwidth.

Precautions

There is only one null interface, namely, NULL 0.

Example

Display the status of Null 0 interface.

```
<Huawei> display interface null 0
NULL0 current state : UP
Line protocol current state : UP (spoofing)
Description:HUAWEI, AR Series, NULL0 Interface
Route Port,The Maximum Transmit Unit is 1500
Internet protocol processing : disabled
Physical is NULL DEV
Current system time: 2012-08-28 15:09:56
    Last 300 seconds input rate 0 bits/sec, 0 packets/sec
    Last 300 seconds output rate 0 bits/sec, 0 packets/sec
    Realtime 2 seconds input rate 0 bits/sec, 0 packets/sec
    Realtime 2 seconds output rate 0 bits/sec, 0 packets/sec
    Input: 0 bytes
    Output:0 bytes
    Input bandwidth utilization  :    0%
    Output bandwidth utilization :    0%
```

Table 5-72 Description of the display interface null command output

Item	Description
NULL0 current state	Physical status of the null interface. The physical status of the null interface remains Up.
Line protocol current state	Link layer protocol status of the null interface. The link layer protocol status of the null interface remains Up.
Description	Description of the interface. Up to 242 case-sensitive characters (including spaces) can be entered. The description helps know the functions of the interface.
The Maximum Transmit Unit is	Maximum transmission unit (MTU). The value is 1500 bytes.
Internet protocol processing : disabled	No IP address is assigned to the interface.
Physical is NULL DEV	The interface does not exist physically.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
Current system time	Current system time. If the system is configured with a time zone and is in the summer time, the time is displayed in the format of YYYY/MM/DD HH:MM:SS UTC±HH:MM DST.
Last 300 seconds input rate Last 300 seconds output rate	Rates for sending and receiving the bytes and the packets by the interface in the last five minutes.
Realtime 2 seconds input rate Realtime 2 seconds output rate	Real-time rates of sending and receiving the bytes and the packets within 2 seconds. It refers to the interval between two **display** commands that are run on the same interface. The maximum value is the statistical interval displayed in the previous piece of information. This entry is displayed only when information about a logical interface is viewed.
Input	Total number of packets and total number of bytes received by the interface.
Output	Total number of packets and total number of bytes sent by the interface.
Input bandwidth utilization	Percentage of the rate for receiving packets to the total bandwidth.
Output bandwidth utilization	Percentage of the rate for sending packets to the total bandwidth.

Related Topics

5.20.11 interface null

5.20.4 display interface virtual-ethernet

Function

The **display interface virtual-ethernet** command displays the status of a virtual Ethernet (VE) interface.

If no interface number is specified, information about all VE interfaces is displayed.

Format

display interface virtual-ethernet [*ve-number*]

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
ve-number	Specifies the number of a VE interface. The interface number consists of the slot ID, card number, and sequence number.	-

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

The **display interface virtual-ethernet** command displays the status of a VE interface, including the current physical status, link layer protocol status, last time the link layer protocol status goes Up, description, MTU, IP address, frame format, maximum QoS bandwidth, output queue status, and current system time.

Example

Display the status of VE 0/0/0.

```
<Huawei> display interface virtual-ethernet 0/0/0
Virtual-Ethernet0/0/0 current state : UP
Line protocol current state : UP
Description:HUAWEI, AR Series, Virtual-Ethernet0/0/0 Interface
Route Port,The Maximum Transmit Unit is 1500
Internet protocol processing: 10.1.1.1/24
IP Sending Frames' Format is PKTFMT_ETHNT_2, Hardware address is 0000-0000-0000
Current system time: 2010-09-07 15:27:28
    Input bandwidth utilization  : 0%
    Output bandwidth utilization : 0%
```

Table 5-73 Description of the display interface virtual-Ethernet command output

Item	Description
Virtual-Ethernet0/0/0 current state	Physical status of the VE interface: • UP: indicates that the interface works properly. • DOWN: indicates that the physical connection of the interface is Down. • Administratively down: indicates that the administrator has run the **shutdown** command on the interface.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Line protocol current state	Link layer protocol status of the interface: • UP: indicates that the link layer protocol on the interface is Up. • DOWN: indicates that the link layer protocol on the interface is Down or no IP address is assigned to the interface.
Description	Description of the interface. A maximum of 242 case-sensitive characters (including spaces) can be entered. The description helps know the functions of the interface.
The Maximum Transmit Unit is	MTU of the interface. The default value of the MTU is 1500 bytes on a serial interface. Packets whose size is greater than the MTU are fragmented before being transmitted. If fragmentation is not allowed, the packets are discarded.
Internet protocol processing : disabled	No IP address is assigned to the interface, the information is displayed as "Internet protocol processing : disabled ". If an IP address is assigned to the interface, the IP address and subnet mask are displayed.
IP Sending Frames' Format is	Frame format of the sent IP packets.
Current system time:	Current system time. If the system is configured with a time zone and is in the summer time, the time is displayed in the format of YYYY/MM/DD HH:MM:SS UTC±HH:MM DST.
Input bandwidth utilization	Percentage of the rate for receiving packets to the total bandwidth.
Output bandwidth utilization	Percentage of the rate for sending packets to the total bandwidth.

Related Topics

5.20.12 interface virtual-ethernet

5.20.5 display virtual-access

Function

The **display virtual-access** command displays the virtual access interface status.

Copyright © Huawei Technologies Co., Ltd.

Format

display virtual-access [**vt** *vt-number* | **dialer** *dialer-interface-number* | **user** *user-name* | **peer** *peer-address* | *va-number*]*

Parameters

Parameter	Description	Value
vt *vt-number*	Specifies the number of the VT interface bound to the VA interface.	The value is an integer that ranges from 0 to 1023.
dialer *dialer-interface-number*	Specifies the number of the dialer interface bound to the VA interface.	The value is an integer and the value depend on the device.
user *user-name*	Specifies the user name for logging in to the VA interface.	The value is a string of 1 to 64 case-sensitive characters without spaces.
peer *peer-address*	Specifies the IP address of the peer device connected to the VA interface.	The value is in dotted decimal notation.
va-number	Specifies the number of the VA interface.	The value is an integer that ranges from 0 to 1023.

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

A VA interface is generated after the VT interface is instantiated. A VA interface is generated for one PPP connection. For example, a VA interface is generated for a PPPoE session or a PPPoFR connection.

Whether multiple VA interfaces can be generated on a VT interface depends on the MP binding mode. For details, see the **ppp mp binding-mode** command.

When monitoring the interface status or locating faults on an interface, you can run the **display virtual-access** command to obtain the status of and statistics on the interface.

If no parameter is specified, the status of all VT interfaces are displayed.

 Copyright © Huawei Technologies Co., Ltd.

Example

Display the status of all VA interfaces when a VA interface is generated on a VT interface.

```
<Huawei> display virtual-access
Virtual-Template1:0 current state : UP
Line protocol current state : UP
Last line protocol up time : 2012-07-18 10:54:39
Description:HUAWEI, AR Series, Virtual-Template1:0 Interface
Route Port,The Maximum Transmit Unit is 1500, Hold timer is 10(sec)
Link layer protocol is PPP
LCP opened, MP opened, IPCP opened
Physical is IPCP
Current system time: 2012-07-18 10:56:28
    Last 300 seconds input rate 0 bits/sec, 0 packets/sec
    Last 300 seconds output rate 0 bits/sec, 0 packets/sec
    Realtime 0 seconds input rate 0 bits/sec, 0 packets/sec
    Realtime 0 seconds output rate 0 bits/sec, 0 packets/sec
    Input: 0 bytes
    Output:0 bytes
    Input bandwidth utilization  :    0%
    Output bandwidth utilization :    0%
```

Table 5-74 Description of the display virtual-access command output

Item	Description
Virtual-Template1:0 current state	Virtual-Template interface status: • UP: indicates that the physical status of the interface is Up. • DOWN: indicates that the physical status of the interface is Down. In this field, the number following Virtual-Template indicates "VT interface number:VA interface number". For example, 1:0 indicates that the VT interface number is 1 and VA interface number is 0.
Line protocol current state	Link layer protocol status of the interface: • UP: indicates that the link layer protocol status of the interface is Up. • DOWN: indicates that the link layer protocol status of the interface is Down or no IP address is assigned to the interface.
Last line protocol up time	Last time the link layer protocol of the interface goes Up.
Description	Interface description.
The Maximum Transmit Unit is	Maximum Transmission Unit (MTU) of the interface. The default MTU on a serial interface is 1480 bytes. Packets whose size is greater than the MTU are fragmented before being transmitted. If non-fragmentation is enabled, the packets are discarded.
Hold timer is	Lifecycle of a packet. If a packet is not sent out before the hold timer times out, the packet is discarded.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Link layer protocol is	Link layer protocol type.
LCP	Status of the Link Control Protocol (LCP). The LCP status is as follows: • Initial: indicates that the physical layer is unavailable. • Starting: indicates that the physical layer is starting. The device retains in Starting state for a short time. • Closed: indicates that the device sends a Terminate-Ack packet to terminate the connection after receiving the Configure-Request packet. • Stopped: indicates that the device receives the Configure-Request packet, but does not receive a Configure-Ack packet from the peer device. In this case, the device sends a Terminate-Ack packet. • Closing: indicates that the connection is being closed. The device enters the Closed state if the device receives a Configure-Ack packet from the peer device or the timer expires. The device retains in Closing state for a short time. • Stopping: indicates that the connection is being closed to prevent subsequent traffic transmission. The device retains in Stopping state for a short time. • Req-Sent: indicates an attempt to establish a connection. The device sends a Configure-Request packet, but does not receive a Configure-Ack packet from the peer device. • Ack-Rcvd: indicates that the device sends a Configure-Request packet and receives a Configure-Ack packet from the peer device but does not receive a Configure-Ack packet to the peer device. • Ack-Sent: indicates that the device sends a Configure-Request packet and a Configure-Ack packet to the peer device and receives a Configure-Ack packet from the peer device. • Opened: indicates that the device sends a Configure-Ack packet to the peer device and receives a Configure-Ack packet from the peer device. The link layer works properly.
MP	MP link status. If the MP link is in Opened state, the MP link works properly. The MP link is in Opened state only when the LCP status of all member links in the MP link is Opened.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
IPCP	Internet Protocol Control Protocol (IPCP) status of the MP link. If IPCP is in Opened state, the MP link works properly. The IPCP status of the MP link is Opened only when the IPCP status of the primary link in the MP link is Opened.
Current system time	Current system time. If the time zone is configured and system time uses the daylight-saving-time (DST). The time is in YYYY/MM/DD HH:MM:SS UTC±HH:MM DST format.
Last 300 seconds input rate	Incoming packet rate (bits per second and packets per second) within the last 300 seconds.
Last 300 seconds output rate	Outgoing packet rate (bits per second and packets per second) within the last 300 seconds.
Realtime 0 seconds input rate	Rate of packets received when this command is being executed.
Realtime 0 seconds output rate	Rate of packets sent when this command is being executed.
Input	Total number of received packets.
Output	Total number of sent packets.
Input bandwidth utilization	Inbound bandwidth usage.
Output bandwidth utilization	Outbound bandwidth usage.

Related Topics

7.3.8 ppp mp binding-mode

5.20.6 display interface virtual-template

Function

Using the **display interface virtual-template** command, you can view the status of a virtual template (VT) interface.

Format

display interface virtual-template [*vt-number*]

 Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
vt-number	Displays the status of the specified VT interface. If no VT number is specified, the status of all VT interfaces is displayed.	The value is an integer that ranges from 0 to 1023.

Views

All views

Default Level

1: Monitoring level

Usage Guidelines

The **display interface virtual-template** command displays the status of a VT interface, including the current physical status, link layer protocol and its status, IP address, description, output queue status, incoming and outgoing packet rates in bit/s and pps, total numbers of packets and bytes received and sent by the VT interface, and percentages of the rates for receiving and sending packets to the total bandwidth.

Example

Display the status of a specified VT interface.

```
<Huawei> display interface virtual-template 1
Virtual-Template1 current state : UP
Line protocol current state :UP (spoofing)Description:HUAWEI, AR Series, Virtual-Template1 InterfaceRoute
Port,The Maximum Transmit Unit is 1500
Internet Address is 10.1.1.1/24
Link layer protocol is PPP
LCP initial, MP opened
Physical is None, baudrate is 64000 bps
Current system time: 2007-09-06 20:57:31
    Last 300 seconds input rate 0 bits/sec, 0 packets/sec
    Last 300 seconds output rate 0 bits/sec, 0 packets/sec
    Realtime 2 seconds input rate 0 bits/sec, 0 packets/sec
    Realtime 2 seconds output rate 0 bits/sec, 0 packets/sec
    Input: 0 bytes
    Output:0 bytes
    Input bandwidth utilization  :    0%
    Output bandwidth utilization :    0%
```

Table 5-75 Description of the display interface virtual-template command output

Item	Description
Virtual-Template1 current state	Physical status of the VT interface: • UP: indicates that the interface works properly.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Line protocol current state	Link layer protocol status of the interface: • UP (spoofing): indicates that the link layer protocol of the interface is always Up with the spoofing feature enabled.
Link layer protocol is	Link layer protocol.
Internet Address is	IP address assigned to the interface. If no IP address is assigned to the interface, "Internet protocol processing : disabled" is displayed.
LCP initial,, MP opened	Indicates the status of LCP.
Description	Description of the interface. A maximum of 242 case-sensitive characters (including spaces) can be entered. The description helps you to know the functions of the interface.
The Maximum Transmit Unit is	MTU of the interface. The default value of the MTU is 1500 bytes on a serial interface. Packets whose size is greater than the MTU are fragmented before being transmitted. If fragmentation is not allowed, the packets are discarded.
Physical is None	No physical interface exists. Logical interfaces do not exist physically.
Current system time	Current system time. If the system is configured with a time zone and is in the summer time, the time is displayed in the format of YYYY/MM/DD HH:MM:SS UTC±HH:MM DST.
Last 300 seconds input rate Last 300 seconds output rate	Rates of the bytes and the packets that the interface sends and receives in the last 300 seconds.
Realtime 2 seconds input rate Realtime 2 seconds output rate	Real-time rates of sending and receiving the bytes and the packets within 2 seconds. It refers to the interval between two **display** commands that are run on the same interface. The maximum value is the statistical interval displayed in the previous piece of information. This entry is displayed only when information about a logical interface is viewed.
Input	Total number of packets and total number of bytes received by the interface.
Output	Total number of packets and total number of bytes sent by the interface.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
Input bandwidth utilization	Percentage of the rate for receiving packets to the total bandwidth.
Output bandwidth utilization	Percentage of the rate for sending packets to the total bandwidth.

Related Topics

5.20.13 interface virtual-template

5.20.7 mac-address (Virtual-Ethernet interface view)

Function

The **mac-address** command configures a MAC address for the Virtual-Ethernet interface.

The **undo mac-address** command deletes the MAC address that is configured for the Virtual-Ethernet interface.

By default, the MAC address of the Virtual-Ethernet interface is the system MAC address.

NOTE

Only Layer 3 VE interfaces support this command.

Format

mac-address *mac-address*

undo mac-address

Parameters

Parameter	Description	Value
mac-address	Specifies a MAC address of a Virtual-Ethernet interface.	The MAC address is in the format of H-H-H. H is a hexadecimal number that contains one to four digits, such as 00e0 and fc01. If an H contains less than four digits, 0s are padded ahead. For example, if you specify an H as e0, it is displayed as 00e0. The MAC address cannot be FFFF-FFFF-FFFF, 0000-0000-0000, or a multicast MAC address.

Views

Virtual-Ethernet interface view, Virtual-Ethernet sub-interface view

Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The MAC address of a Virtual-Ethernet interface is the system MAC address, and may conflict with the MAC address of another interface (a physical or logical interface). If the MAC address of the Virtual-Ethernet interface conflicts with that of another interface, a loop probably occurs or traffic forwarding on the Virtual-Ethernet interface may fail.

In this case, you must run the **mac-address** command to configure a MAC address for the Virtual-Ethernet interface to guarantee the normal transmission of service data flows.

Configuration Impact

After the MAC address of the Virtual-Ethernet interface is changed, the device sends gratuitous ARP packets to the remote device so that the remote device can refresh its ARP entries.

Example

Configure a MAC address for VE 0/0/1.

```
<Huawei> system-view
[Huawei] interface virtual-ethernet 0/0/1
[Huawei-Virtual-Ethernet0/0/1] mac-address 0001-2345-abcd
```

Related Topics

5.20.4 display interface virtual-ethernet

5.20.8 mtu

Function

The **mtu** command sets the maximum transmission unit (MTU) of an interface.

The **undo mtu** command restores the default MTU of an interface.

By default, the MTU of an interface is 1500 bytes.

Format

mtu *size*

undo mtu

 Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
size	Specifies the MTU of an interface.	The value is an integer that ranges from 128 to 1500, in bytes.

Views

Virtual template interface view, dialer interface view, MP-Group interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Generally, the IP layer limits the size of a packet sent each time. Any time the IP layer receives an IP packet, it checks to which local interface the packet needs to be sent and obtains the MTU of the interface. Then, the IP layer compares the MTU with the packet size. If the packet size is larger than the MTU, the IP layer disassembles the packet to fragments smaller than the MTU.

If forcible unfragmentation is configured, oversized packets are discarded at the IP layer. To prevent packet loss on the network, oversized packets must be forcibly fragmented. You can run the **mtu** command to set the size of a fragment.

Precautions

After running the **mtu** command on an interface, restart the interface to make the configured MTU take effect.

You can restart an interface by using the following methods:

- Run the **shutdown** command and then the **undo shutdown** command.
- Run the **restart** command.

NOTE

The device does not support restart of a virtual template interface.

Example

Set the MTU of Virtual-template 10 to 1200 bytes.

```
<Huawei> system-view
[Huawei] interface virtual-template 10
[Huawei-Virtual-Template10] mtu 1200
[Huawei-Virtual-Template10] restart
```

 Copyright © Huawei Technologies Co., Ltd.

5.20.9 interface (FR sub-interface)

Function

Using the **interface** command, you can create a sub-interface on the interface whose link layer protocol is FR.

Using the **undo interface** command, you can delete a sub-interface from the interface whose link layer protocol is FR.

Format

interface *interface-type interface-number.subinterface-number* [**p2mp** | **p2p**]

undo interface *interface-type interface-number.subinterface-number*

Parameters

Parameter	Description	Value
interface *interface-type interface-number*	Specifies the type and number of the interface whose link layer protocol is FR. **NOTE** The E1, T1, CE1/PRI, CT1/PRI, E1–F, T1–F, CPOS, ISDN BRI, or SA interface can configure the link layer protocol as frame relay.	-
subinterface-number	Specifies the number of a sub-interface.	The value is an integer that ranges from 1 to 1024.
p2mp	Sets the network type of a sub-interface to P2MP. P2MP is the default sub-interface network type when the link layer protocol of a main interface is FR.	-
p2p	Sets the network type of a sub-interface to P2P.	-

Views

System view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Sub-interfaces are logical (virtual) interfaces configured on a main interface. Sub-interfaces can share physical parameters of their main interface or be configured

 Copyright © Huawei Technologies Co., Ltd.

with their respective link layer parameters and network layer parameters. The sub-interface status change does not affect the main interface status, but the main interface status change affects the status of sub-interfaces. Sub-interfaces work properly only when their main interface is in the Up state.

To implement various services such as MPLS and VPN services on an interface whose link layer protocol is FR, you can configure these services on different sub-interfaces of the interface.

Prerequisites

The link layer protocol of the main interface is FR.

Precautions

When a main interface is configured with a sub-interface, the interval between running the **shutdown** and **undo shutdown** commands on the main interface must be at least 15 seconds.

Example

Create sub-interface Serial2/0/0.1.

```
<Huawei> system-view
[Huawei] interface serial 2/0/0.1
[Huawei-Serial2/0/0.1]
```

Related Topics

5.1.16 shutdown (interface view)

5.20.10 interface loopback

Function

The **interface loopback** command creates a loopback interface.

The **undo interface loopback** command deletes a loopback interface.

Format

interface loopback *loopback-number*

undo interface loopback *loopback-number*

Parameters

Parameter	Description	Value
loopback-number	Specifies the number of a loopback interface.	The VE sequence number range depends on the device.

Views

System view

 Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

A loopback interface is always Up at the physical layer and link layer unless it is manually shut down.

The IP address of a loopback interface is usually specified as the source address of packets.

Example

Create loopback interface 5.

```
<Huawei> system-view
[Huawei] interface loopback 5
[Huawei-LoopBack5]
```

Related Topics

5.20.2 display interface loopback

5.20.11 interface null

Function

Using the **interface null** command, you can enter the null interface view.

Format

interface null 0

Parameters

None

Views

System view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The Null0 interface never forwards or accepts any traffic. All traffic sent to this interface is directly discarded. Unnecessary traffic can be sent to the Null0 interface to avoid using ACLs.

Precautions

 Copyright © Huawei Technologies Co., Ltd.

There is only one null interface, named null0. This interface is always Up and cannot be shut down or deleted.

Example

Enter the view of the Null0 interface.

```
<Huawei> system-view
[Huawei] interface null 0
[Huawei-NULL0]
```

Related Topics

5.20.3 display interface null

5.20.12 interface virtual-ethernet

Function

Using the **interface virtual-ethernet** command, you can create a virtual Ethernet (VE) interface.

Using the **undo interface virtual-ethernet** command, you can delete a VE interface.

Format

interface virtual-ethernet *ve-number*

undo interface virtual-ethernet *ve-number*

Parameters

Parameter	Description	Value
ve-number	Specifies the number of a VE interface, in the format of slot number/card number/sequence number. The card number can be the number of an absent card.	The VE sequence number range depends on the device.

Views

System view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

A VE interface is a logical interface that has Ethernet features. When PPPoE packets or IPoE packets need to be transmitted over an ATM network, a VE

 Copyright © Huawei Technologies Co., Ltd.

interface is required to implement interworking between PPPoE and ATM, or between IPoE and ATM.

Precautions

VE sub-interfaces can be created only after the VE main interface is created. The value of the VE sub-interface number ranges from 1 to 1024.

If a VE interface is bound to a physical interface, you must unbind the VE interface from the physical interface before deleting the VE interface.

Example

Create a VE interface 0/0/12.

```
<Huawei> system-view
[Huawei] interface virtual-ethernet 0/0/12
[Huawei-Virtual-Ethernet0/0/12]
```

Create a VE sub-interface 0/0/12.1.

```
<Huawei> system-view
[Huawei] interface virtual-ethernet 0/0/12
[Huawei-Virtual-Ethernet0/0/12] quit
[Huawei] interface virtual-ethernet 0/0/12.1
[Huawei-Virtual-Ethernet0/0/12.1]
```

Related Topics

5.20.4 display interface virtual-ethernet

5.20.13 interface virtual-template

Function

Using the **interface virtual-template** command, you can create a virtual template (VT) interface and enter the VT interface view.

Using the **undo interface virtual-template** command, you can delete a VT interface.

Format

interface virtual-template *vt-number*

undo interface virtual-template *vt-number*

Parameters

Parameter	Description	Value
vt-number	Specifies the number of a VT interface.	The VE sequence number range depends on the device.

Views

System view

Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Layer 2 protocols such as PPP and ATM cannot transmit packets of each other, and need to communicate by using virtual access (VA) interfaces. When Layer 2 protocols need to communicate, the system automatically creates a VA interface. You can configure a VA interface only by setting attributes for a VT interface. A VT interface is used by the system to configure VA interfaces.

Prerequisites

A VT interface has been created before the system creates a VA interface.

Precautions

After a VT interface is deleted, all of its derived VA interfaces are deleted automatically.

The link layer protocol of a VT interface is Up only when VA interfaces in Up state exist on the VT interface.

Example

Create VT interface 10.

```
<Huawei> system-view
[Huawei] interface virtual-template 10
[Huawei-Virtual-Template10]
```

Related Topics

5.20.6 display interface virtual-template

5.20.14 statistic enable

Function

Using the **statistic enable** command, you can enable the traffic statistics collection function on an interface.

Using the **undo statistic enable** command, you can restore the default setting.

By default, the traffic statistics collection function is disabled on an interface.

Format

statistic enable { **inbound** | **outbound** }

undo statistic enable { **inbound** | **outbound** }

 Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
inbound	Enables the traffic statistics collection function for incoming traffic on an interface.	-
outbound	Enables the traffic statistics collection function for outgoing traffic on an interface.	-

Views

Ethernet sub-interface view, GE sub-interface view, XGE sub-interface view, MFR interface view, Layer 3 Virtual Ethernet interface view, Dialer interface view, VLANIF interface view, MP-group interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

After the traffic statistics collection function is enabled on an interface, you can collect statistics about incoming and outgoing traffic on the interface.

Precautions

If the traffic statistics collection function has been configured on the maximum interfaces, running the **statistic enable** command will fail.

If you run the **statistic enable inbound** command to enable traffic statistics collection for incoming traffic on an interface, statistics about incoming traffic on the interface will be cleared.

When the traffic statistics collection function is enabled on a VLANIF interface using this command, the number of error packets on the interface will not be collected. If interfaces on the 8FE1GE, 24GE, and 24ES2GP cards are added to VLANs, statistics on traffic forwarded on the VLANIF interfaces are not collected.

Follow-up Procedure

Run the **display interface** command to view traffic statistics.

Example

Enable the traffic statistics collection function for incoming traffic on Ethernet2/0/0.1.

```
<Huawei> system-view
```

 Copyright © Huawei Technologies Co., Ltd.

```
[Huawei] interface ethernet2/0/0.1
[Huawei-Ethernet2/0/0.1] statistic enable inbound
```

Related Topics

5.1.4 display interface

5.20.15 statistic ip enable

Function

Using the **statistic ip enable** command, you can enable the IPv4 traffic statistics collection function on an interface.

Using the **undo statistic ip enable** command, you can restore the default setting.

By default, the IP traffic statistics collection function is disabled on an interface.

NOTE

The SRU80, SRU100, SRU200, SRU400, and SRUX5 do not support this command.

Format

statistic ip enable { **inbound** | **outbound** }

undo statistic ip enable { **inbound** | **outbound** }

Parameters

Parameter	Description	Value
inbound	Enables the IP traffic statistics collection function for incoming traffic on an interface.	-
outbound	Enables the IP traffic statistics collection function for outgoing traffic on an interface.	-

Views

Dialer interface view, VLANIF interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Copyright © Huawei Technologies Co., Ltd.

After the IPv4 traffic statistics collection function is enabled on an interface, you can collect statistics about incoming and outgoing IP traffic on the interface.

Precautions

You can configure the IPv4 traffic statistics collection function on a maximum of 4096 interfaces. If the IP traffic statistics collection function has been configured on 4096 interfaces, running the **statistic ip enable** command will fail.

When the IPv4 traffic statistics collection function is enabled on a VLANIF interface using this command, the number of error packets on the interface will not be collected. If interfaces on the 8FE1GE, 24GE, and 24ES2GP cards are added to VLANs, statistics on traffic forwarded on the VLANIF interfaces are not collected.

Follow-up Procedure

Run the **display interface** command to view IP traffic statistics.

Example

Enable the IPv4 traffic statistics collection function for incoming traffic on VLANIF100.

```
<Huawei> system-view
[Huawei] interface vlanif 100
[Huawei-Vlanif100] statistic ip enable inbound
```

Related Topics

5.1.4 display interface

5.20.16 statistic ipv6 enable

Function

Using the **statistic ipv6 enable** command, you can enable the IPv6 traffic statistics collection function on an interface.

Using the **undo statistic ipv6 enable** command, you can restore the default setting.

By default, the IPv6 traffic statistics collection function is disabled on an interface.

NOTE

The SRU80, SRU100, SRU200, SRU400, and SRUX5 do not support this command.

Format

statistic ipv6 enable { **inbound** | **outbound** }

undo statistic ipv6 enable { **inbound** | **outbound** }

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Descripv6tion	Value
inbound	Enables the IPv6 traffic statistics collection function for incoming traffic on an interface.	-
outbound	Enables the IPv6 traffic statistics collection function for outgoing traffic on an interface.	-

Views

Dialer interface view, VLANIF interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

After the IPv6 traffic statistics collection function is enabled on an interface, you can collect statistics about incoming and outgoing IPv6 traffic on the interface.

Precautions

You can configure the IPv6 traffic statistics collection function on a maximum of 4096 interfaces. If the IPv6 traffic statistics collection function has been configured on 4096 interfaces, running the **statistic ipv6 enable** command will fail.

When the IPv6 traffic statistics collection function is enabled on a VLANIF interface using this command, the number of error packets on the interface will not be collected. If interfaces on the 8FE1GE, 24GE, and 24ES2GP cards are added to VLANs, statistics on traffic forwarded on the VLANIF interfaces are not collected.

Follow-up Procedure

Run the **display interface** command to view IPv6 traffic statistics.

Example

Enable the IPv6 traffic statistics collection function for incoming traffic on VLANIF100.

```
<Huawei> system-view
[Huawei] interface vlanif 100
[Huawei-Vlanif100] statistic ipv6 enable inbound
```

 Copyright © Huawei Technologies Co., Ltd.

Related Topics

5.1.4 display interface

5.20.17 trigger trap

Function

Using the **trigger trap** command, you can configure an interface to send traps to the NMS.

Format

trigger trap { **linkup** | **linkdown** }

Parameters

Parameter	Description	Value
linkup	Sends the LinkUp trap to the NMS.	-
linkdown	Sends the LinkDown trap to the NMS.	-

Views

Loopback interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

The traps configured by **trigger trap** are used to check whether the network between the NMS and device functions properly. If the NMS receives a trap sent from the interface, the network between the NMS and device functions properly; otherwise, a fault may occur on the network.

Prerequisites

Run the **snmp-agent trap enable feature-name** command to enable the LinkUp and LinkDown traps.

Precautions

The **trigger trap** command is used on loopback interfaces to check the network between the NMS and device. The interface status does not change according to the meaning of the trap. For example, if the **trigger trap linkdown** command is used, the loopback interface sends a LinkDown trap to the NMS but does not change its status to Down. If you have used the **trigger trap linkdown** command, you must run the **trigger trap linkup** command to clear the LinkDown trap on the NMS.

Copyright © Huawei Technologies Co., Ltd.

Example

Configure a loopback interface to send the LinkUp trap to the NMS.

```
<Huawei> system-view
[Huawei] interface loopback 1
[Huawei-LoopBack1] trigger trap linkup
```

5.21 transparent transmission commands

5.21.1 display transport info

Function

The **display transport info** command displays the service configuration of the current serial interface.

Format

display transport info

Parameters

None

Views

TTY user interface view

Default Level

1: Monitoring level

Usage Guidelines

A router can function as a server or client to transparently transmit data through the serial interface in TCP or UDP mode. You can run the **display transport info** command to check information, such as the transmission mode, connection type, IP address of the remote device, interface number, about the router in TCP server, TCP client, and UDP client modes of transparent transmission through the serial interface, respectively.

Example

Display the service configuration of the current serial interface when the router functions as a TCP server.

```
<Huawei> system-view
[Huawei] user-interface tty 9
[Huawei-ui-tty9] display transport info
**************************************************************************
 TTYIndex                    9     IsTransEnable             Enabled
 TransMode                 RAW       ConnectType           TCP Server
 MaxClientNum                4     TcpIdleTimeOut                 0
```

 Copyright © Huawei Technologies Co., Ltd.

```
PacketTimer                 100      PacketSize                  0
SpecialChar                        best-effort              Disabled
RS232Mode               Disabled      TTY2Mode                 RS485
Server Port                60000      IsSetClientIp               No
*****************************************************************************
```

Display the service configuration of the current serial interface when the router functions as a TCP client.

```
<Huawei> system-view
[Huawei] user-interface tty 9
[Huawei-ui-tty9] display transport info
*****************************************************************************
TTYIndex                    9      IsTransEnable             Enabled
TransMode                   RAW      ConnectType               TCP Client
MaxServerNum                  100      TcpServerCount                 0
TcpIdleTimeOut                0      PacketSize                  0
PacketTimer                 100      best-effort               Disabled
SpecialChar                        TTY2Mode                    RS485
RS232Mode               Disabled
Server IP           1.1.2.1      Server Port               60000
Server IP           1.1.2.1      Server Port               60001
*****************************************************************************
```

Table 5-76 Description of the **display transport info** command output

Item	Description
TTYIndex	Index of the user interface view.
IsTransEnable	Whether the RAW service function is enabled. To enable the RAW service function, run the **raw-transport enable** command.
TransMode	Transmission mode for transparent data transmission through the serial interface. • None: no service mode • RAW: transparent transmission mode To configure the transmission mode, run the **mode (TTY user interface view)** command.
ConnectType	Connection type for transparent data transmission through the serial interface. • TCP server • TCP client • UDP client To configure the connection type, run the **raw-transport server-port** command.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
MaxClientNum	Maximum number of clients that the router functioning as a server can be connected to. The value is 4.
MaxServerNum	Maximum number of servers that the router functioning as a client can be connected to. The value is 100.
TcpClientCount	Current number of clients that the router functioning as a server is connected to.
TcpServerCount	Current number of servers that the router functioning as a client is connected to.
TcpIdleTimeOut	Timeout interval for TCP connections. To configure the timeout interval for TCP connections, run the **raw-transport tcp idle-timeout** command.
PacketSize	Size of an encapsulated packet. To configure the size of an encapsulated packet, run the **raw-transport packet-size** command.
PacketTimer	Packet encapsulation timer. To configure the packet encapsulation timer, run the **raw-transport packet-timer** command.
best-effort	Whether the best-effort function is enabled. To enable the best-effort function, run the **raw-transport best-effort** command.
SpecialChar	Special character of an encapsulated packet. To configure the special character of an encapsulated packet, run the **raw-transport special-char** command.
TTY2Mode	TTY2 mode. • RS485 • RS422 To configure the TTY2 mode, run the **raw-transport tty2-mode** command.
RS232Mode	Whether the RS232 serial interface mode is enabled. To configure the RS232 serial interface mode, run the **raw-transport server-port** command.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
Server IP	IP address of the server. To configure the IP address of the server, run the **raw-transport server-port** command.
Server Port	Interface number of the server. To configure the interface number of the server, run the **raw-transport server-port** command.
IsSetClientIp	Whether the IP address of the client is configured. To configure the IP address of the client, run the **raw-transport server-port** command.

Related Topics

5.21.2 display transport mode
5.21.3 display transport session
5.21.4 display transport stat

5.21.2 display transport mode

Function

The **display transport mode** command displays the service mode of the current serial interface.

Format

display transport mode

Parameters

None

Views

TTY user interface view

Default Level

1: Monitoring level

Usage Guidelines

After checking the service mode of the current serial interface using the **display transport mode** command, you can run the **mode** command to enter the service mode of the current serial interface or switch to another service mode of the serial interface base on actual requirements.

Copyright © Huawei Technologies Co., Ltd.

Example

Display the service mode of the current serial interface.

```
<Huawei> system-view
[Huawei] user-interface tty 1
[Huawei-ui-tty1] display transport mode
Info: Current TTY mode is RAW.
```

Table 5-77 Description of the **display transport mode** command output

Item	Description
Current TTY mode	Service mode of the current serial interface. • none • raw To configure the service mode of the current serial interface, run the **mode (TTY user interface view)** command.

Related Topics

6.2.26 mode

5.21.3 display transport session

Function

The **display transport session** command displays session information about the current serial interface.

Format

display transport session

Parameters

None

Views

TTY user interface view

Default Level

1: Monitoring level

Usage Guidelines

A router can function as a server or client to transparently transmit data through the serial interface in TCP or UDP mode. You can run the **display transport**

Copyright © Huawei Technologies Co., Ltd.

session command to check the session ID, establishment time of the session, and the IP address and interface number of the client or server for which the session is established.

Example

Display session information about the current serial interface when the router functions as a TCP server.

```
<Huawei> system-view
[Huawei] user-interface tty 9
[Huawei-ui-tty9] display transport session
 ******************************************************************************
 TTYIndex                    9      IsTransEnable             Enabled
 TransMode                   RAW    ConnectType               TCP Server
 Server Port                 60000
 Session                     1      Time           2017-12-11 12:07:53
 Client IP           1.1.2.1        Client Port               53094
 Session                     2      Time           2017-12-11 12:08:04
 Client IP           1.1.2.1        Client Port               53122

 ******************************************************************************
```

Display session information about the current serial interface when the router functions as a TCP client.

```
<Huawei> system-view
[Huawei] user-interface tty 9
[Huawei-ui-tty9] display transport session
 ******************************************************************************
 TTYIndex                    9      IsTransEnable             Enabled
 TransMode                   RAW    ConnectType               TCP Client
 MaxServerNum                100    TcpIdleTimeOut            0
 PacketTimer                 100    PacketSize                0
 SpecialChar                        best-effort               Disabled
 RS232Mode           Disabled       TTY2Mode                  RS485
 Server IP           1.1.2.1        Server Port               60000
 Server IP           1.1.2.1        Server Port               60001
 ******************************************************************************
```

Table 5-78 Description of the **display transport session** command output

Item	Description
TTYIndex	Index of the user interface view.
IsTransEnable	Whether the RAW service function is enabled. To configure the RAW service function, run the **raw-transport enable** command.
TransMode	Transmission mode for transparent data transmission through the serial interface. • None: no service mode • RAW: transparent transmission mode To configure the transmission mode, run the **mode (TTY user interface view)** command.

Copyright © Huawei Technologies Co., Ltd.

Item	Description
ConnectType	Connection type for transparent data transmission through the serial interface. • TCP server • TCP client • UDP client To configure the connection type, run the **raw-transport server-port** command.
Session	Session ID. To delete a specified session, run the **kick-out session** command.
Time	Connection time of a session.
ServerPort	Interface number of the server. To configure the interface number of the server, run the **raw-transport server-port** command.
Server IP	IP address of the server. To configure the IP address of the server, run the **raw-transport server-port** command.
Client IP	IP address of the client. To configure the IP address of the client, run the **raw-transport server-port** command.
Client Port	Interface number of the client. To configure the interface number of the client, run the **raw-transport server-port** command.

Related Topics

5.21.5 kick-out session
5.21.2 display transport mode
5.21.4 display transport stat
5.21.1 display transport info

5.21.4 display transport stat

Function

The **display transport stat** command displays packet statistics of the current serial interface.

Copyright © Huawei Technologies Co., Ltd.

Format

display transport stat

Parameters

None

Views

TTY user interface view

Default Level

1: Monitoring level

Usage Guidelines

A router can function as a server or client to transparently transmit data through the serial interface in TCP or UDP mode. You can run the **display transport stat** command to check packet statistics information of the current serial interface, including the number of times sessions are established, number of times sessions are rejected, number of received packets, and number of sent packets.

Example

Display status information about the current serial interface when the router functions as a TCP server.

```
<Huawei> system-view
[Huawei] user-interface tty 9
[Huawei-ui-tty9] display transport stat
 ******************************************************************************
 TTYIndex                    9      IsTransEnable             Enabled
 TransMode                   RAW    ConnectType                 TCP Server
 Serial Tx                   0      Serial Rx                   0
 Session                     1
 Client IP           1.1.2.1      Client Port               53094
 Socket Tx                   0      Socket Rx                   0
 Session                     2
 Client IP           1.1.2.1      Client Port               53122
 Socket Tx                   0      Socket Rx                   0

 ******************************************************************************
```

Display status information about the current serial interface when the router functions as a TCP client.

```
<Huawei> system-view
[Huawei] user-interface tty 9
[Huawei-ui-tty9] display transport stat
 ******************************************************************************
 TTYIndex                    9      IsTransEnable             Enabled
 TransMode                   RAW    ConnectType                 TCP Client
 Serial Tx                   0      Serial Rx                   0
 Session                     3
 Server IP           1.1.2.1      Server Port               60000
 TTYIndex                    9      IsTransEnable             Enabled
 TransMode                   RAW    ConnectType                 TCP Client
 Serial Tx                   0      Serial Rx                   0
 Session                     3
```

 Copyright © Huawei Technologies Co., Ltd.

```
Server IP            1.1.2.1     Server Port              60000
******************************************************************************
```

Table 5-79 Description of the **display transport stat** command output

Item	Description
TTYIndex	Index of the user interface view.
IsTransEnable	Whether the RAW service function is enabled. To configure the RAW service function, run the **raw-transport enable** command.
TransMode	Transmission mode for transparent data transmission through the serial interface. • None: no service mode • RAW: transparent transmission mode To configure the transmission mode, run the **mode (TTY user interface view)** command.
ConnectType	Connection type for transparent data transmission through the serial interface. • TCP server • TCP client • UDP client To configure the connection type, run the **raw-transport server-port** command.
Serial Tx	Number of packets sent through the serial interface.
Serial Rx	Number of packets received through the serial interface.
Session	Session ID. To delete a specified session, run the **kick-out session** command.
ServerPort	Interface number of the server. To configure the interface number of the server, run the **raw-transport server-port** command.
Server IP	IP address of the server. To configure the IP address of the server, run the **raw-transport server-port** command.

 Copyright © Huawei Technologies Co., Ltd.

Item	Description
Client IP	IP address of the client. To configure the IP address of the client, run the **raw-transport server-port** command.
Client Port	Interface number of the client. To configure the interface number of the client, run the **raw-transport server-port** command.
Socket Tx	Number of sent packets on the TCP or UDP layer.
Socket Rx	Number of received packets on the TCP or UDP layer.

Related Topics

5.21.2 display transport mode
5.21.3 display transport session
5.21.1 display transport info

5.21.5 kick-out session

Function

The **kick-out session** command deletes the specified session connection.

Format

kick-out session *session-id*

Parameters

Parameter	Description	Value
session-id	Specifies the session ID.	The value is an integer that ranges from 1 to 4294967290.

Views

TTY user interface view

Default Level

2: Configuration level

Usage Guidelines

A unique session ID (*session-id*) is allocated to each connection in the TTY user interface view. You can check session information of the current serial interface

Copyright © Huawei Technologies Co., Ltd.

using the **display transport session** command. Deleting the session connection corresponding to the value of *session-id* using the **kick-out session** command is similar to disabling the RAW service using the **undo raw-transport enable** command in the RAW service view.

Example

Delete the session connection with the ID 100.

```
<Huawei> system-view
[Huawei] user-interface tty 1
[Huawei-ui-tty1] kick-out session 100
```

Related Topics

5.21.3 display transport session

5.21.9 raw-transport enable

5.21.6 mode (TTY user interface view)

Function

The **mode** command configures the service mode of the serial interface, and displays the corresponding service view or an existing service view.

By default, the service mode of the serial interface is none.

Format

mode { **none** | **raw** | **scada** | **modbus-transport** }

Parameters

Parameter	Description	Value
none	Sets the service mode of the serial interface to none.	-
raw	Sets the service mode of the serial interface to RAW.	-
scada	Sets the service mode of the serial interface to SCADA. This is a reserved parameter.	-
modbus-transport	Sets the service mode of the serial interface to modbus-transport. This is a reserved parameter.	-

Views

TTY user interface view

Default Level

2: Configuration level

Copyright © Huawei Technologies Co., Ltd.

Usage Guidelines

Usage Scenario

After running the **mode** command, you can enter the corresponding service view and configure corresponding service functions. You can configure the following modes based on actual requirements:

- None: no service mode
- RAW: transparent transmission mode

Prerequisites

Transparent transmission through the serial interface has been enabled using the **socket-transport enable** command before the **mode raw** command is run on the RS232 serial interface.

Example

Set the service mode of the serial interface to the RAW mode and display the RAW service view.

```
<Huawei> system-view
[Huawei] user-interface tty 1
[Huawei-ui-tty1] socket-transport enable
Info : RS232 has been changed to service mode.
[Huawei-ui-tty1] mode raw
[Huawei-ui-tty1-raw]
```

5.21.7 raw-transport server-port

Function

The **raw-transport server-port** command configures transmission parameters for transparent transmission through the serial interface.

The **undo raw-transport** { **tcp** | **udp** } **client server-port** *server-port* **server-ip** *server-ip* command deletes transmission parameters specified in the RAW service view.

The **undo** { **tcp** | **udp** } command deletes all transmission parameters in the RAW service view.

By default, the working mode of the router for transparent transmission through the serial interface is not configured.

Format

raw-transport tcp server server-port *server-port* [**client-ip** *client-ip*] [**vpn-instance** *vpn-instance-name*]

raw-transport tcp client server-port *server-port* **server-ip** *server-ip* [**vpn-instance** *vpn-instance-name*]

raw-transport udp client server-port *server-port* **server-ip** *server-ip*

undo raw-transport tcp client server-port *server-port* **server-ip** *server-ip* [**vpn-instance** *vpn-instance-name*]

 Copyright © Huawei Technologies Co., Ltd.

undo raw-transport udp client server-port *server-port* **server-ip** *server-ip*

undo { **tcp** | **udp** }

NOTE

Only V200R010C10 and later versions support the **vpn-instance** *vpn-instance-name* parameter.

Parameters

Parameter	Description	Value
tcp server	Configures the router as a server to transparently transmit data through the serial interface in TCP mode.	-
tcp client	Configures the router as a client to transparently transmit data through the serial interface in TCP mode.	-
udp client	Configures the router as a client to transparently transmit data through the serial interface in UDP mode.	-
server-port *server-port*	Specifies the listening interface number of the server.	The value is an integer that ranges from 1 to 65534.
server-ip *server-ip*	Specifies the IP address of the server to which the listened router is connected.	The value is in dotted decimal notation, and must be a valid IP address of class A, B, or C. A maximum of 100 different IP addresses of servers can be configured.
client-ip *client-ip*	Specifies the IP address of the client that needs to be listened and is connected to the router.	The value is in dotted decimal notation, and must be a valid IP address of class A, B, or C. If the **client-ip** *client-ip* parameter is not specified, the router can randomly connect to a maximum of four clients. If the **client-ip** *client-ip* is specified, the client has occupied a connection and the router can randomly connect to a maximum of three clients.

 Copyright © Huawei Technologies Co., Ltd.

Parameter	Description	Value
vpn-instance *vpn-instance-name*	Specifies the name of the VPN instance to which the transparent transmission service of a serial port is bound.	The value is a string of 1 to 31 case-sensitive characters without spaces.

Views

RAW service view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

Major differences between transparent transmission through the serial interface in TCP and UDP modes are as follows:

- TCP is connection-oriented and provides a data retransmission mechanism. It has high requirements for the network quality and real-time data transmission. When the network quality is poor, packet loss may occur.
- UDP is connectionless and does not provide a data retransmission mechanism. It has low requirements for the network quality and real-time data transmission.

You can choose an appropriate mode based on data integrity, network quality, and real-time data transmission requirements.

Precautions

If the RAW service has been enabled, run the **undo raw-transport enable** command to disable the RAW service before running the **raw-transport server-port** command. Otherwise, an error message is displayed.

For the same TTY, you can select only one mode from the TCP client, TCP server, and UDP client modes. The latest configured mode takes effect. A router functioning as a client can be connected to a maximum of 100 servers. A router functioning as a server can be connected to a maximum of four clients.

The system verifies the configured IP address and interface number.

- The following IP addresses are invalid:
  - Addresses with all 0s or 1s
  - Multicast addresses (class D addresses)
  - Loopback addresses (in the 127.x.x.x format)
  - Broadcast addresses of classes A, B, and C
- When the router functions as a server, values of *server-port* configured in different TTYs cannot be the same at the same time.

 Copyright © Huawei Technologies Co., Ltd.

- When the router functions as a client, values of *server-ip* configured in different TTYs cannot be the same at the same time.

Example

Configure the router as a server to transparently transmit data through the serial interface in TCP mode.

```
<Huawei> system-view
[Huawei] user-interface tty 1
[Huawei-ui-tty1] mode raw
[Huawei-ui-tty1-raw] raw-transport tcp server server-port 1111 client-ip 10.1.1.100
```

Configure the router as a client to transparently transmit data through the serial interface in TCP mode.

```
<Huawei> system-view
[Huawei] user-interface tty 1
[Huawei-ui-tty1] mode raw
[Huawei-ui-tty1-raw] raw-transport tcp client server-port 1111 server-ip 10.1.1.100
```

Configure the router as a client to transparently transmit data through the serial interface in UDP mode.

```
<Huawei> system-view
[Huawei] user-interface tty 1
[Huawei-ui-tty1] mode raw
[Huawei-ui-tty1-raw] raw-transport udp client server-port 1111 server-ip 10.1.1.100
```

Related Topics

5.21.16 undo parameter

5.21.8 raw-transport best-effort

Function

The **raw-transport best-effort** command enables the best effort mode, so that the router discards old data from the cache first.

undo best-effort command disables the best effort mode.

By default, the best effort mode is disabled, so that the router discards new data from the cache first.

Format

raw-transport best-effort

undo best-effort

Parameters

None

Views

RAW service view

 Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

By default, the router discards new data from the cache first. After the **raw-transport best-effort** command is run, the router discards old data from the cache first.

Precautions

If the RAW service has been enabled, run the **undo raw-transport enable** command to disable the RAW service before running the **raw-transport best-effort** command. Otherwise, an error message is displayed.

Example

Configure the best effort mode, so that the router discards old data from the cache first.

```
<Huawei> system-view
[Huawei] user-interface tty 1
[Huawei-ui-tty1] mode raw
[Huawei-ui-tty1-raw] raw-transport best-effort
```

Related Topics

5.21.9 raw-transport enable

5.21.1 display transport info

5.21.9 raw-transport enable

Function

The **raw-transport enable** command enables the RAW service function.

The **undo raw-transport enable** command disables the RAW service function.

By default, the RAW service function is disabled.

Format

raw-transport enable

undo raw-transport enable

Parameters

None

Views

RAW service view

 Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

Configuration commands run in the RAW service view take effect only after the RAW service function is enabled.

Example

Enable the RAW service function.

```
<Huawei> system-view
[Huawei] user-interface tty 1
[Huawei-ui-tty1] mode raw
[Huawei-ui-tty1-raw] raw-transport enable
```

Related Topics

5.21.11 raw-transport packet-timer

5.21.1 display transport info

5.21.10 raw-transport packet-size

Function

The **raw-transport packet-size** command configures the size of an encapsulated packet.

The **undo packet-size** command cancels the configured size of an encapsulated packet.

By default, the size of an encapsulated packet is not configured. The router does not encapsulate received packets and sends them without changing their sizes (not greater than 2000 bytes).

Format

raw-transport packet-size *size*

undo packet-size

Parameters

Parameter	Description	Value
size	Specifies the size of an encapsulated packet.	The value is an integer that ranges from 16 to 1400, in bytes.

Views

RAW service view

 Copyright © Huawei Technologies Co., Ltd.

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

After the size of an encapsulated packet is configured, the router only sends packets whose sizes reach the specified size.

Precautions

If the RAW service has been enabled, run the **undo raw-transport enable** command to disable the RAW service before running the **raw-transport packet-size** command. Otherwise, an error message is displayed.

Example

Set the size of an encapsulated packet to 100 bytes.

```
<Huawei> system-view
[Huawei] user-interface tty 1
[Huawei-ui-tty1] mode raw
[Huawei-ui-tty1-raw] raw-transport packet-size 100
```

Related Topics

5.21.1 display transport info

5.21.11 raw-transport packet-timer

Function

The **raw-transport packet-timer** command configures the packet encapsulation timer.

The **undo packet-timer** command restores the default interval of the packet encapsulation timer.

By default, the interval of the packet encapsulation timer is 100 ms.

Format

raw-transport packet-timer *time*

undo packet-timer

Parameters

Parameter	Description	Value
time	Specifies the periodic packet sending time.	The value is an integer that ranges from 20 to 100000, in milliseconds. The value must be an integer multiple of 20, for example, 40, 60, or 80.

Copyright © Huawei Technologies Co., Ltd.

Views

RAW service view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

If the packet encapsulation timer is configured and a router does not obtain packets within a specified period, the router sends received packets.

Precautions

If the RAW service has been enabled, run the **undo raw-transport enable** command to disable the RAW service before running the **raw-transport packet-timer** command. Otherwise, an error message is displayed.

Example

Set the interval of the packet encapsulation timer to 200 ms.

```
<Huawei> system-view
[Huawei] user-interface tty 1
[Huawei-ui-tty1] mode raw
[Huawei-ui-tty1-raw] raw-transport packet-timer 200
```

Related Topics

5.21.9 raw-transport enable

5.21.1 display transport info

5.21.12 raw-transport special-char

Function

The **raw-transport special-char** command enables the special character filtering function.

The **undo special-char** command disables the special character filtering function.

By default, the special character filtering function is disabled.

Format

raw-transport special-char *char-value*

undo special-char

 Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
char-value	Specifies the special character to be filtered.	The value is an integer that ranges from 0 to 255.

Views

RAW service view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

If the special character filtering function is enabled and a router receives a packet containing a special character, the router immediately sends the packet.

Precautions

If the RAW service has been enabled, run the **undo raw-transport enable** command to disable the RAW service before running the **raw-transport special-char** command. Otherwise, an error message is displayed.

Example

Enable the special character filtering function and set the special character to be filtered to 3.

```
<Huawei> system-view
[Huawei] user-interface tty 1
[Huawei-ui-tty1] mode raw
[Huawei-ui-tty1-raw] raw-transport special-char 3
```

5.21.13 raw-transport tcp idle-timeout

Function

The **raw-transport tcp idle-timeout** command configures the timeout interval for TCP connections.

The **undo idle-timeout** command restores the default timeout interval for TCP connections.

By default, the timeout interval for TCP connections is 0 minutes.

Format

raw-transport tcp idle-timeout *time*

undo idle-timeout

Copyright © Huawei Technologies Co., Ltd.

Parameters

Parameter	Description	Value
time	Specifies the timeout interval for TCP connections.	The value is an integer that ranges from 0 to 60, in minutes.

Views

RAW service view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

By default, the timeout interval for TCP connections is 0 minutes, indicating that TCP connections are not automatically disconnected. For security purposes, you can disconnect TCP connections if the router does not receive or send any data within a specified period. If a router functions a server and the TCP connection is disconnected, the router re-enters the listening status and waits from the next connection. If a router functions as a client and the TCP connection is disconnected, the TCP connection is automatically re-established when data needs to be sent.

Precautions

If the RAW service has been enabled, run the **undo raw-transport enable** command to disable the RAW service before running the **raw-transport tcp idle-timeout** command. Otherwise, an error message is displayed.

Example

Set the timeout interval for TCP connections to 2 minutes.

```
<Huawei> system-view
[Huawei] user-interface tty 1
[Huawei-ui-tty1] mode raw
[Huawei-ui-tty1-raw] raw-transport tcp idle-timeout 2
```

Related Topics

5.21.9 raw-transport enable

5.21.1 display transport info

5.21.14 raw-transport tty2-mode

Function

The **raw-transport tty2-mode** command configures the working mode of the TTY2.

Copyright © Huawei Technologies Co., Ltd.

By default, the working mode of the TTY2 is RS485.

Format

raw-transport tty2-mode *mode*

Parameters

Parameter	Description	Value
mode	Specifies the working mode of the TTY2.	The value is a character string and can be: • RS485 • RS422

Views

RAW service view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

You can set the working mode of the TTY2 to RS485 or RS422 using the **raw-transport tty2-mode** command. This command takes effect only for the TTY2.

Precautions

If the RAW service has been enabled, run the **undo raw-transport enable** command to disable the RAW service before running the **raw-transport tty2-mode** command. Otherwise, an error message is displayed.

Example

Set the working mode of the TTY2 to RS422.

```
<Huawei> system-view
[Huawei] user-interface tty 2
[Huawei-ui-tty2] mode raw
[Huawei-ui-tty2] raw-transport tty2-mode rs422
```

Related Topics

5.21.9 raw-transport enable

5.21.1 display transport info

Copyright © Huawei Technologies Co., Ltd.

5.21.15 socket-transport enable

Function

The **socket-transport enable** command switches the RS232 serial interface of a router from the management mode to the service mode.

The **undo socket-transport enable** command switches the RS232 serial interface of a router from the service mode back to the management mode.

By default, the RS232 serial interface is a management interface.

NOTE

The 8AS interface board does not support the **socket-transport enable** command.

Format

socket-transport enable

undo socket-transport enable

Parameters

None

Views

TTY user interface view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

By default, the RS232 serial interface of a router functions as a management interface and users can perform configuration management using this interface. After the **socket-transport enable** command is run, the RS232 serial interface of a router is switched from a management interface to a service interface for transparent transmission through the serial interface. In this case, the local router can receive data of the remote device when interconnected with the remote device.

The RJ45 and RS485 serial interfaces are service interfaces, and the serial interface modes do not need to be switched.

Precautions

The RS232 serial interface cannot receive data from a management interface after being switched to a service interface. To switch a serial interface back to a management interface, run the **undo socket-transport enable** command. You need to log in to the router and be authenticated again after a switchover.

 Copyright © Huawei Technologies Co., Ltd.

Only the TTY1 interface supports the **socket-transport enable** command.

Example

Enable the function of transparent transmission through the serial interface.

```
<Huawei> system-view
[Huawei] user-interface tty 1
[Huawei-ui-tty1] socket-transport enable
Info : RS232 has been changed to service mode.
```

Related Topics

5.21.1 display transport info

5.21.16 undo parameter

Function

The **undo parameter** command deletes all RAW service configurations.

Format

undo parameter

Parameters

None

Views

RAW service view

Default Level

2: Configuration level

Usage Guidelines

Usage Scenario

To delete all RAW service configurations in the RAW service view, run the **undo parameter** command.

Prerequisites

The RAW service function has been disabled using the **undo raw-transport enable** command.

Example

Delete all RAW service configurations.

```
<Huawei> system-view
[Huawei] user-interface tty 1
[Huawei-ui-tty1] mode raw
```

 Copyright © Huawei Technologies Co., Ltd.

```
[Huawei-ui-tty1-raw] undo raw-transport enable
[Huawei-ui-tty1-raw] undo parameter
```

 Copyright © Huawei Technologies Co., Ltd.