HP MSR2000/3000/4000 Router Series

Interface

Command Reference (V7)

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display interface range

Use **display interface range** to display information about the specified interface range or all existing interface ranges.

Syntax

display interface range [**name** *name*]

Views

Any view

Predefined user roles

network-admin

network-operator

Parameters

name *name*: Specifies an interface range by its name, a case-sensitive string of 1 to 32 characters. If you do not specify an interface range name, this command displays information about all existing interface ranges.

Examples

Display information about all existing interface ranges.

```
<Sysname> display interface range
Interface range name t2 Ethernet1/1 Ethernet1/2
Interface range name test Ethernet1/11 Ethernet1/12
```

The output shows that interfaces Ethernet 1/1 and Ethernet 1/2 are added to interface range named **t2**, and interfaces Ethernet 1/11 and Ethernet 1/12 are added to interface range named **test**.

Related commands

interface range name

interface range

Use **interface range** to create an interface range and enter the interface range view.

Syntax

interface range *interface-list*

Views

System view

Predefined user roles

network-admin

Parameters

interface-list: Specifies an interface list in the format of *interface-list* = { *interface-type interface-number* [**to** *interface-type interface-number*] }&<1-5>. The *interface-type interface-number* argument specifies an interface by its type and number. &<1-5> indicates that you can specify up to five interfaces or interface lists. When you specify the **to** keyword in *interface-type interface-number1* **to** *interface-type interface-number2*, the interfaces before and after the **to** keyword must be on the same interface card or subcard. The last-tier value of the interface number before **to** must not be greater than the one after **to**, and the values of the other tiers of the interface number before **to** must be the same as the one after **to**.

Usage guidelines

Use this command to enter interface range view to bulk configure multiple interfaces with the same feature instead of configuring them one by one. For example, run the **shutdown** command in interface range view to shut down a range of interfaces.

In interface range view, only the commands supported by the first interface are available. The first interface is specified with the **interface range** command. To view these commands in the interface range, enter the interface range view, and then enter **?** at the prompt.

If the application of a command fails on one member interface, the application of the command on the other member interfaces is not affected. In this case, the system displays an error message and continues with the next member interface.

To verify the configuration of the first interface in the interface range, execute the **display this** command in interface range view.

To bulk configure interfaces, follow these guidelines:

- If you cannot enter the view of an interface by using the **interface** *interface-type* { *interface-number* | *interface-number.subnumber* } command, for example, BRI 1/1/1:1, do not configure the interface as the first interface in the interface range.
- No limit is set on the maximum number of interfaces in an interface range. The more interfaces in an interface range, the longer the command execution time.

Examples

Shut down interfaces Ethernet 1/1 through Ethernet 1/24, VLAN interface 2, and Serial 7/1 through Serial 7/7.

```
<Sysname> system-view
[Sysname] interface range ethernet 1/1 to ethernet 1/24 vlan-interface 2 serial 7/1 to serial 7/7
[Sysname-if-range] shutdown
```

interface range name

Use **interface range name** *name* **interface** *interface-list* to create an interface range, configure a name for the interface range, and enter the interface range view.

Use **interface range name** *name* without the **interface** keyword to enter the view of an interface range with the specified name.

Use **undo interface range name** to delete the interface range with the specified name.

Syntax

interface range name *name* [**interface** *interface-list*]

undo interface range name *name*

Views

System view

Predefined user roles

network-admin

Parameters

name: Specifies an interface range name, a case-sensitive string of 1 to 32 characters.

interface-list: Specifies an interface list in the format of *interface-list* = { *interface-type interface-number* [**to** *interface-type interface-number*] }&<1-5>. The *interface-type interface-number* argument specifies an interface by its type and number. &<1-5> indicates that you can specify up to five interfaces or interface lists. When you specify the **to** keyword in *interface-type interface-number1* **to** *interface-type interface-number2*, the interfaces before and after the **to** keyword must be on the same interface card or subcard. The last-tier value of the interface number before **to** must not be greater than the one after **to**, and the values of the other tiers of the interface number before **to** must be the same as the one after **to**.

Usage guidelines

You can use this command to assign a name to an interface range and can specify this name rather than the interface range to enter the interface range view.

In interface range view, only the commands supported by the first interface are available. The first interface is specified with the **interface range** command. To view the commands supported by the first interface in the interface range, enter the interface range view and enter a question mark (?) at the command line interface prompt.

Failure of applying a command on one member interface does not affect the application of the command on the other member interfaces. If applying a command on one member interface fails, the system displays an error message and continues with the next member interface.

To verify the configuration of the first interface in the interface range, execute the **display this** command in interface range view.

To view the member interfaces of an interface range, use the **display current-configuration | include "interface range"** command.

To bulk configure interfaces, follow these guidelines:

- If you cannot enter the view of an interface by using the **interface** *interface-type* { *interface-number* | *interface-number.subnumber* } command, for example, BRI 1/1/1:1, do not configure the interface as the first interface in the interface range.
- No limit is set on the maximum number of interfaces in an interface range. The more interfaces in an interface range, the longer the command execution time.
- The maximum number of interface range names is only limited by the system resources. To guarantee bulk interface configuration performance, HP recommends configuring fewer than 1000 interface range names.

Examples

Add Ethernet 1/1 through Ethernet 1/12 to interface range named **myEthPort**, and enter the interface range view.

```
<Sysname> system-view
[Sysname] interface range name myEthPort interface ethernet 1/1 to ethernet 1/12
[Sysname-if-range-myEthPort]
```

Enter the view of interface range named **myEthPort**.

```
<Sysname> system-view
[Sysname] interface range name myEthPort
[Sysname-if-range-myEthPort]
```

Related commands

display interface range

Ethernet interface commands

Common Ethernet interface commands

bandwidth

Use **bandwidth** to configure the expected bandwidth of an interface.

Use **undo bandwidth** to restore the default.

Syntax

bandwidth *bandwidth-value*

undo bandwidth

Default

The expected bandwidth (in kbps) is the interface baud rate divided by 1000.

Views

Ethernet interface view, Ethernet subinterface view

Predefined user roles

network-admin

Parameters

bandwidth-value: Specifies the expected bandwidth in the range of 1 to 400000000 kbps.

Usage guidelines

The expected bandwidth of an interface affects the following items:

- Bandwidth assignment with CBQ. For more information, see *ACL and QoS Configuration Guide*.
- Link costs in OSPF, OSPFv3, and IS-IS. For more information, see *Layer 3—IP Routing Configuration Guide*.

Examples

Set the expected bandwidth of interface Ethernet 1/1 to 1000 kbps.

```
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] bandwidth 1000
```

Set the expected bandwidth of subinterface Ethernet 1/1.1 to 1000 kbps.

```
<Sysname> system-view
[Sysname] interface ethernet 1/1.1
[Sysname-Ethernet1/1.1] bandwidth 1000
```

Related commands

speed

combo enable

Use **combo enable** to activate the copper or fiber combo port.

Syntax

combo enable { **copper** | **fiber** }

Default

The copper combo port is activated.

Views

Ethernet interface view

Predefined user roles

network-admin

Parameters

copper: Activates the copper combo port. In this case, use twisted pairs to connect the port.

fiber: Activates the fiber combo port. In this case, use optical fibers to connect the port.

Usage guidelines

A combo interface is a logical interface that physically comprises one fiber port and one copper port on the device panel. The two ports share one forwarding interface, so they cannot work simultaneously. When you enable either port, the other port is automatically disabled. You can select to activate the copper port or fiber port as needed.

When the **loopback** command is running on a combo interface, you cannot use the **combo enable** command on the combo interface.

Examples

Activate the copper combo port of combo interface GigabitEthernet 1/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/1
[Sysname-GigabitEthernet1/1] combo enable copper
```

Activate the fiber combo port of combo interface GigabitEthernet 1/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/1
[Sysname-GigabitEthernet1/1] combo enable fiber
```

default

Use **default** to restore the default settings for an Ethernet interface or subinterface.

Syntax

default

Views

Ethernet interface view, Ethernet subinterface view

Predefined user roles

network-admin

Usage guidelines

CAUTION:

The **default** command might interrupt ongoing network services. Make sure you are fully aware of the impacts of this command when you use it in a live network.

This command might fail to restore the default settings for some commands for reasons such as command dependencies and system restrictions. Use the **display this** command in interface view to identify these commands, and then use their **undo** forms or follow the command reference to individually restore their default settings. If your restoration attempt still fails, follow the error message instructions to resolve the problem.

Examples

Restore the default settings for interface Ethernet 1/1.

```
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] default
```

Restore the default settings for subinterface Ethernet 1/1.1.

```
<Sysname> system-view
[Sysname] interface ethernet 1/1.1
[Sysname-Ethernet1/1.1] default
```

description

Use **description** to change the description of an interface.

Use **undo description** to restore the default.

Syntax

description *text*

undo description

Default

The description of an interface is the interface name plus **Interface** (for example, **Ethernet1/1 Interface**).

Views

Ethernet interface view, Ethernet subinterface view

Predefined user roles

network-admin

Parameters

text: Specifies the interface description, a case-sensitive string of 1 to 80 characters.

Examples

Change the description of interface Ethernet 1/1 to **lanswitch-interface**.

```
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] description lanswitch-interface
```

Change the description of Ethernet subinterface Ethernet 1/1.1 to **l2-subinterface1/1.1**.

```
<Sysname> system-view
```

```
[Sysname] interface ethernet 1/1.1
[Sysname-Ethernet1/1.1] description l2-subinterface1/1.1
```

display counters

Use **display counters** to display interface traffic statistics.

Syntax

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

Views

Any view

Predefined user roles

network-admin

network-operator

Parameters

inbound: Displays inbound traffic statistics.

outbound: Displays outbound traffic statistics.

interface-type: Specifies an interface type.

interface-number: Specifies an interface number.

interface-number.subnumber: Specifies a subinterface number, where *interface-number* is an interface number, and *subnumber* is the number of a subinterface created under the interface. The value range for the *subnumber* argument is 1 to 4094.

Usage guidelines

This command displays traffic statistics within a statistics polling interval specified by the **flow-interval** command.

To clear the Ethernet interface traffic statistics, use the **reset counters interface** command. For more information, see "reset counters interface."

If no interface type is specified, this command displays traffic statistics for all interfaces that have traffic counters.

If an interface type is specified but no interface number or subinterface number is specified, this command displays traffic statistics for all interfaces of the specified type.

If an interface type and an interface number or subinterface number are specified, this command displays traffic statistics of the specified interface or subinterface.

Examples

Display inbound traffic statistics for all Ethernet interfaces.

```
<Sysname> display counters inbound interface ethernet
Interface            Total (pkts)    Broadcast (pkts)    Multicast (pkts)  Err (pkts)
Eth1/1                        100                 100                   0           0
Eth1/2                          0                   0                   0           0
Eth1/3                   Overflow            Overflow            Overflow    Overflow
Eth1/4                          0                   0                   0           0
```

```
Overflow: More than 14 digits (7 digits for column "Err").
      --: Not supported.
```

Table 1 Command output

Field	Description
Interface	Abbreviated interface name.
Total (pkts)	Total number of packets received or sent through the interface.
Broadcast (pkts)	Total number of broadcast packets received or sent through the interface.
Multicast (pkts)	Total number of multicast packets received or sent through the interface.
Err (pkts)	Total number of error packets received or sent through the interface.
Overflow: More than 14 digits (7 digits for column "Err")	The command displays **Overflow** if any of the following cases applies: • The data length of an **Err** field value is greater than 7 decimal digits. • The data length of a non-Err field value is greater than 14 decimal digits.
--: Not supported	The statistical item is not supported.

Related commands

- **flow-interval**
- **reset counters interface**

display counters rate

NOTE:

GE interfaces do not support this command.

Use **display counters rate** to display traffic rate statistics of interfaces in up state over the last statistics polling interval.

Syntax

display counters rate { **inbound** | **outbound** } **interface** [*interface-type* [*interface-number* | *interface-number.subnumber*]]

Views

Any view

Predefined user roles

network-admin

network-operator

Parameters

inbound: Displays inbound traffic rate statistics.

outbound: Displays outbound traffic rate statistics.

interface-type: Specifies an interface type.

interface-number: Specifies an interface number.

interface-number.subnumber: Specifies a subinterface number, where *interface-number* is an interface number, and *subnumber* is the number of a subinterface created under the interface. The value range for the *subnumber* argument is 1 to 4094.

Usage guidelines

The statistics cover only interfaces in up state.

If an interface type is specified, the command displays traffic rate statistics for all up interfaces of the specified type over the last statistics polling interval.

If no interface type is specified, the command displays traffic rate statistics for all up interfaces that have traffic counters over the last statistics polling interval.

If an interface which is always down over the last statistics polling interval is specified, the system prompts that the interface does not support the command.

Use the **flow-interval** command to set the statistics polling interval.

Examples

Display the inbound traffic rate statistics for all Ethernet interfaces.

```
<Sysname> display counters rate inbound interface ethernet
Interface              Total (pps)       Broadcast (pps)       Multicast (pps)
Eth2/0                           0                    --                    --
Eth2/2                           0                    --                    --
Eth2/3                           0                    --                    --
Eth4/0                           0                    --                    --
Eth4/1                           0                    --                    --
Eth4/2                           0                    --                    --
Eth4/5                        4223                    --                    --
Eth4/6                           0                    --                    --
Eth4/7                           0                    --                    --
Eth4/8                           0                    --                    --

Overflow: More than 14 digits.
      --: Not supported.
```

Table 2 Command output

Field	Description
Interface	Abbreviated interface name.
Total (pkts/sec)	Average rate (in pps) of receiving or sending packets during the statistics polling interval.
Broadcast (pkts/sec)	Average rate (in pps) of receiving or sending broadcast packets during the statistics polling interval.
Multicast (pkts/sec)	Average rate (in pps) of receiving or sending multicast packets during the statistics polling interval.
Overflow: more than 14 decimal digits	The command displays **Overflow** if the data length of a statistical item is greater than 14 decimal digits.
--: not supported	The statistical item is not supported.

Related commands

- **flow-interval**
- **reset counters interface**

display ethernet statistics

Use **display ethernet statistics** to display the Ethernet statistics.

Syntax

MSR2000/MSR3000:

display ethernet statistics

MSR4000:

display ethernet statistics slot *slot-number*

Views

User view

Predefined user roles

network-admin

network-operator

Parameters

slot *slot-number*: Displays the Ethernet statistics on the specified card. The *slot-number* argument represents the number of the slot that houses the card. (MSR4000)

Examples

Display the Ethernet statistics. (MSR2000/MSR3000)

```
<Sysname> display ethernet statistics
ETH receive packet statistics:
    Totalnum        : 10447          ETHIINum     : 4459
    SNAPNum         : 0              RAWNum       : 0
    LLCNum          : 0              UnknownNum   : 0
    ForwardNum      : 4459           ARP          : 0
    MPLS            : 0              ISIS         : 0
    ISIS2           : 0              IP           : 0
    IPV6            : 0
ETH receive error statistics:
    NullPoint       : 0              ErrIfindex   : 0
    ErrIfcb         : 0              IfShut       : 0
    ErrAnalyse      : 5988           ErrSrcMAC    : 5988
    ErrHdrLen       : 0

ETH send packet statistics:
    L3OutNum        : 211            VLANOutNum   : 0
    FastOutNum      : 155            L2OutNum     : 0
ETH send error statistics:
    MbufRelayNum    : 0              NullMbuf     : 0
    ErrAdjFwd       : 0              ErrPrepend   : 0
```

```
    ErrHdrLen       : 0             ErrPad       : 0
    ErrQoSTrs       : 0             ErrVLANTrs   : 0
    ErrEncap        : 0             ErrTagVLAN   : 0
    IfShut          : 0             IfErr        : 0
```

Display the Ethernet statistics on slot 2. (MSR4000)

```
<Sysname> display ethernet statistics slot 2
ETH receive packet statistics:
    Totalnum        : 10447         ETHIINum     : 4459
    SNAPNum         : 0             RAWNum       : 0
    LLCNum          : 0             UnknownNum   : 0
    ForwardNum      : 4459          ARP          : 0
    MPLS            : 0             ISIS         : 0
    ISIS2           : 0             IP           : 0
    IPV6            : 0
ETH receive error statistics:
    NullPoint       : 0             ErrIfindex   : 0
    ErrIfcb         : 0             IfShut       : 0
    ErrAnalyse      : 5988          ErrSrcMAC    : 5988
    ErrHdrLen       : 0

ETH send packet statistics:
    L3OutNum        : 211           VLANOutNum   : 0
    FastOutNum      : 155           L2OutNum     : 0
ETH send error statistics:
    MbufRelayNum    : 0             NullMbuf     : 0
    ErrAdjFwd       : 0             ErrPrepend   : 0
    ErrHdrLen       : 0             ErrPad       : 0
    ErrQoSTrs       : 0             ErrVLANTrs   : 0
    ErrEncap        : 0             ErrTagVLAN   : 0
    IfShut          : 0             IfErr        : 0
```

Table 3 Output description

Field	Description
ETH receive packet statistics	Statistics about the Ethernet packets received on the Ethernet interface module.

Field	Description
Totalnum	Total number of received packets: • **ETHIINum**—Number of packets encapsulated by using Ethernet-II. • **SNAPNum**—Number of packets encapsulated by using SNAP. • **RAWNum**—Number of packets encapsulated by using RAW. • **ISIS**—Number of packets encapsulated by using IS-IS. • **LLCNum**—Number of packets encapsulated by using LLC. • **UnknownNum**—Number of packets encapsulated by using unknown methods. • **ForwardNum**—Number of packets forwarded at Layer 2 or sent to the CPU. • **ARP**—Number of ARP packets. • **MPLS**—Number of MPLS packets. • **ISIS**—Number of IS-IS packets. • **ISIS2**—Number of large 802.3/802.2 frames encapsulated by using IS-IS. • **IP**—Number of IP packets.
ETH receive error statistics	Statistics about the error Ethernet packets in the outbound direction on the Ethernet interface module. Errors might be included in packets or occur during the receiving process. The items include: • **NullPoint**—Number of packets that include null pointers. • **ErrIfindex**—Number of packets that include incorrect interface indexes. • **ErrIfcb**—Number of packets that include incorrect interface control blocks. • **IfShut**—Number of packets that are being received when the interface is shut down. • **ErrAnalyse**—Number of packets that include packet parsing errors. • **ErrSrcMAC**—Number of packets that include incorrect source MAC addresses. • **ErrHdrLen**—Number of packets that include header length errors.
ETH send packet statistics	Statistics about the Ethernet packets sent by the Ethernet interface module: • **L3OutNum**—Number of packets sent out of Layer 3 Ethernet interfaces. • **VLANOutNum**—Number of packets sent out of VLAN interfaces. • **FastOutNum**—Number of packets fast forwarded. • **L2OutNum**—Number of packets sent out of Layer 2 Ethernet interfaces. • **MbufRelayNum**—Number of packets transparently sent.

Field	Description
ETH send error statistics	Statistics about the error Ethernet packets in the outbound direction on the Ethernet interface module: • **NullMbuf**—Number of packets with null pointers. • **ErrAdjFwd**—Number of packets with adjacency table errors. • **ErrPrepend**—Number of packets with extension errors. • **ErrHdrLen**—Number of packets with header length errors. • **ErrPad**—Number of packets with padding errors. • **ErrQoSTrs**—Number of packets that failed to be sent by QoS. • **ErrVLANTrs**—Number of packets that failed to be sent in VLANs. • **ErrEncap**—Number of packets that failed to be sent due to link header encapsulation failures. • **ErrTagVLAN**—Number of packets that failed to be sent due to VLAN tag encapsulation failures. • **IfShut**—Number of packets that are being sent when the interface is shut down. • **IfErr**—Number of packets with incorrect outgoing interfaces.

display interface

Use **display interface** to display Ethernet interface information.

Syntax

display interface [*interface-type*] [**brief** [**down**]]

display interface [*interface-type* [*interface-number* | *interface-number.subnumber*]] [**brief** [**description**]]

Views

Any view

Predefined user roles

network-admin

network-operator

Parameters

interface-type: Specifies an interface type.

interface-number: Specifies an interface number.

interface-number.subnumber: Specifies a subinterface number, where *interface-number* is an interface number, and *subnumber* is the number of a subinterface created under the interface. The value range for the *subnumber* argument is 1 to 4094.

brief: Displays brief interface information. If you do not specify this keyword, the command displays detailed interface information.

down: Displays information about interfaces in the down state and the causes. If you do not specify this keyword, this command displays information about interfaces in all states.

description: Displays the full description of the specified interface. If the keyword is not specified, the command displays at most the first 27 characters of the interface description. If the keyword is specified, the command displays all characters of the interface description.

Usage guidelines

If no interface type is specified, this command displays information about all interfaces.

If an interface type is specified but no interface number or subinterface number is specified, this command displays information about all interfaces of that type.

If both the interface type and interface number are specified, this command displays information about the specified interface.

Examples

Display information about Layer 3 interface Ethernet 1/1.

```
<Sysname> display interface ethernet 1/1
Ethernet1/1 current state: DOWN
Line protocol current state: DOWN
Description: Ethernet1/1 Interface
Bandwidth: 100000kbps
The Maximum Transmit Unit is 100, Hold timer is 10(sec)
Internet protocol processing: disabled
IP Packet Frame Type:PKTFMT_ETHNT_2, Hardware Address: 0001-0001-0001
IPV6 Packet Frame Type:PKTFMT_ETHNT_2, Hardware Address: 0001-0001-0001
    Last 300 seconds input rate 0.00 bytes/sec, 0.00 packets/sec
    Last 300 seconds output rate 0.00 bytes/sec, 0.00 packets/sec
    Input: 0 packets, 0 bytes, 0 buffers
    Output:0 packets, 0 bytes
```

Table 4 Command output

Field	Description
Current state	State of the interface: • **Administratively DOWN**—The Ethernet interface was shut down with the **shutdown** command. The interface is administratively down. • **DOWN**—The Ethernet interface is administratively up but physically down (possibly because no physical link is present or the link has failed). • **UP**—The Ethernet interface is both administratively and physically up.

Field	Description
Line protocol current state	Link layer state of the interface. The state is determined through parameter negotiation on the link layer. • **UP**—The interface is up at the data link layer. • **UP (spoofing)**—The link layer protocol of an interface is UP, but its link is an on-demand link or not present at all. This attribute is typical of Null interfaces and loopback interfaces. • **DOWN**—The interface is down at the data link layer. • **DOWN (DLDP DOWN)**—The link layer protocol of the interface is down because DLDP detects that the link is unidirectional. • **DOWN (LAGG DOWN)**—The link layer protocol of the interface is down because the aggregate interface does not have Selected ports. • **DOWN (OAM DOWN)**—The link layer of the interface is down because OAM detects remote link failures. • **DOWN (DLDP and LAGG DOWN)**—The link layer of the interface is shut down by DLDP and LAGG. • **DOWN (DLDP and OAM DOWN)**—The link layer of the interface is shut down by DLDP and OAM. • **DOWN (OAM and LAGG DOWN)**—The link layer of the interface is shut down by OAM and LAGG. • **DOWN (DLDP, OAM and LAGG DOWN)**—The link layer of the interface is shut down by DLDP, OAM, and LAGG.
Hold timer is	Link-up or link-down event suppression interval.
Bandwidth	Expected bandwidth of the interface.
Internet protocol processing: disabled	Indicates that the interface cannot process IP packets.
Output queue (Urgent queue: Size/Length/Discards)	Output queue (the number of messages, the maximum number of messages allowed, and the number of dropped messages in the urgent queue).
Output queue (Protocol queue: Size/Length/Discards)	Output queue (the number of messages, the maximum number of messages allowed, and the number of dropped messages in the protocol queue).
Output queue (FIFO queuing: Size/Length/Discards)	Output queue (the number of messages, the maximum number of messages allowed, and the number of dropped messages in the FIFO queue).
Last clearing of counters	Time when the **reset counters interface** command was last used to clear the interface statistics. **Never** indicates the **reset counters interface** command has never been used on the interface since the device's startup.
Last 300 seconds input rate	Average input rate over the last 300 seconds in Bps, bps, and pps.
Last 300 seconds output rate	Average output rate over the last 300 seconds in Bps, bps, and pps.
Input: 0 packets, 0 bytes, 0 buffers	Number and size (in bytes) of input packets, and the number of buffers for input packets.
Output:0 packets, 0 bytes	Number and size (in bytes) of output packets.

Display detailed information about Layer 2 interface Ethernet 1/1.

```
<Sysname> display interface ethernet 1/1
```

```
Ethernet1/1 current state: DOWN
Line protocol current state: DOWN
IP Packet Frame Type: PKTFMT_ETHNT_2, Hardware Address: 000c-2963-b767
Description: Ethernet1/1 Interface
Bandwidth: 100000kbps
Loopback is not set
Unknown-speed mode, unknown-duplex mode
Link speed type is autonegotiation, link duplex type is autonegotiation
The Maximum Frame Length is 9216
Allow jumbo frame to pass
Broadcast MAX-ratio: 100%
Multicast MAX-ratio: 100%
Unicast MAX-ratio: 100%
PVID: 1
Mdi type: automdix
Port link-type: access
 Tagged Vlan:   none
 UnTagged Vlan: 1
Port priority: 2
Last clearing of counters:  14:34:09 Tue 11/01/2011
 Peak value of input: 0 bytes/sec, at 00-00-00 00:00:00
 Peak value of output: 0 bytes/sec, at 00-00-00 00:00:00
 Last 300 seconds input:  0 packets/sec 0 bytes/sec 0%
 Last 300 seconds output:  0 packets/sec 0 bytes/sec 0%
 Input (total):  0 packets, 0 bytes
          0 unicasts, 0 broadcasts, 0 multicasts, 0 pauses
 Input (normal):  0 packets, 0 bytes
          0 unicasts, 0 broadcasts, 0 multicasts, 0 pauses
 Input:  0 input errors, 0 runts, 0 giants, 0 throttles
          0 CRC, 0 frame, 0 overruns, 0 aborts
          0 ignored, 0 parity errors
 Output (total): 0 packets, 0 bytes
          0 unicasts, 0 broadcasts, 0 multicasts, 0 pauses
 Output (normal): 0 packets, 0 bytes
          0 unicasts, 0 broadcasts, 0 multicasts, 0 pauses
 Output: 0 output errors, 0 underruns, 0 buffer failures
          0 aborts, 0 deferred, 0 collisions, 0 late collisions
          0 lost carrier, 0 no carrier
```

Table 5 Command output

Field	Description
Current state	State of the Ethernet interface: • **Administratively DOWN**—The Ethernet interface was shut down with the **shutdown** command. The interface is administratively down. • **DOWN**—The Ethernet interface is administratively up but physically down (possibly because no physical link is present or the link has failed). • **UP**—The Ethernet interface is both administratively and physically up.
Line protocol current state	Link layer state of the interface. The state is determined through parameter negotiation on the link layer. • **UP**—The interface is up at the data link layer. • **UP (spoofing)**—The link layer protocol of an interface is UP, but its link is an on-demand link or not present at all. This attribute is typical of Null interfaces and loopback interfaces. • **DOWN**—The interface is down at the data link layer. • **DOWN (DLDP DOWN)**—The link layer protocol of the interface is down because DLDP detects that the link is unidirectional. • **DOWN (LAGG DOWN)**—The link layer protocol of the interface is down because the aggregate interface does not have Selected ports. • **DOWN (OAM DOWN)**—The link layer of the interface is down because OAM detects remote link failures. • **DOWN (DLDP and LAGG DOWN)**—The link layer of the interface is shut down by DLDP and LAGG. • **DOWN (DLDP and OAM DOWN)**—The link layer of the interface is shut down by DLDP and OAM. • **DOWN (OAM and LAGG DOWN)**—The link layer of the interface is shut down by OAM and LAGG. • **DOWN (DLDP, OAM and LAGG DOWN)**—The link layer of the interface is shut down by DLDP, OAM, and LAGG.
IP Packet Frame Type	Ethernet framing format. **PKTFMT_ETHNT_2** indicates that the frames are encapsulated in Ethernet II framing format.
Hardware address	MAC address of the interface.
Bandwidth	Expected bandwidth of the interface.
Loopback is set internal	An internal loopback test is running on the Ethernet interface.
Loopback is set external	An external loopback test is running on the Ethernet interface.
Loopback is not set	No loopback test is running on the Ethernet interface.
Unknown-speed mode	The speed of the interface is unknown because the speed negotiation fails or the interface is physically disconnected.
half-duplex mode	The interface is operating in half duplex mode.
full-duplex mode	The interface is operating in full duplex mode.
unknown-duplex mode	The duplex mode of the interface is unknown because the duplex mode negotiation fails or the interface is physically disconnected.

Field	Description
Link speed type is autonegotiation	The interface is configured with the **speed auto** command.
Link speed type is force link	The interface is configured with a specific speed, for example, 10 Mbps or 100 Mbps, by using the **speed** command.
link duplex type is autonegotiation	The interface is configured with the **duplex auto** command.
link duplex type is force link	The interface is configured with a specific duplex mode, for example, half or full, by using the **duplex** command.
The Maximum Frame Length	Maximum Ethernet frame length allowed on the interface.
Allow jumbo frame to pass	The interface allows jumbo frames to pass through.
Broadcast MAX-	Broadcast storm suppression threshold in ratio, pps, or kbps. The unit of the threshold depends on your configuration.
Multicast MAX-	Multicast storm suppression threshold in ratio, pps, or kbps. The unit of the threshold depends on your configuration.
Unicast MAX-	Unicast storm suppression threshold in ratio, pps, or kbps. The unit of the threshold depends on your configuration.
PVID	Port VLAN ID (PVID) of the Ethernet interface.
Mdi type	Cable type (depending on your configuration): • **automdix**. • **mdi**. • **mdix**.
Port link-type	Link type of the interface (depending on your configuration): • access. • trunk. • hybrid.
Tagged VLAN ID	VLANs for which the interface sends packets without removing VLAN tags.
Untagged VLAN ID	VLANs for which the interface sends packets after removing VLAN tags.
Port priority	Priority of the interface.
Last clearing of counters: Never	Time when the **reset counters interface** command was last used to clear statistics on the interface. **Never** indicates that the **reset counters interface** command was never used since the device was started.
Peak value of input	Peak rate of inbound traffic in Bps, and the time when the peak inbound traffic rate occurred.
Peak value of output	Peak rate of outbound traffic in Bps, and the time when the peak outbound traffic rate occurred.
Last 300 seconds input: 0 packets/sec 0 bytes/sec 0% Last 300 seconds output: 0 packets/sec 0 bytes/sec 0%	Average rate of inbound and outbound traffic in the last 300 seconds, in pps and Bps, and the ratio of the actual rate to the maximum interface rate. A hyphen (-) indicates that the statistical item is not supported.

Field	Description
Input(total): 0 packets, 0 bytes 0 unicasts, 0 broadcasts, 0 multicasts, 0 pauses	Inbound traffic statistics (in packets and bytes) for the interface. All inbound normal and abnormal packets and normal pause frames were counted. Number of inbound unicast packets, number of inbound broadcasts, number of inbound multicasts, and number of inbound pause frames. A hyphen (-) indicates that the statistical item is not supported.
Input(normal): 0 packets, 0 bytes 0 unicasts, 0 broadcasts, 0 multicasts, 0 pauses	Inbound normal traffic and pause frame statistics (in packets and bytes) for the interface. Number of inbound normal unicast packets, number of inbound normal broadcasts, number of inbound normal multicasts, and number of inbound normal pause frames. A hyphen (-) indicates that the statistical item is not supported.
input errors	Statistics of incoming error packets.
runts	Number of inbound frames shorter than 64 bytes, in correct format, and containing valid CRCs.
giants	Number of inbound frames larger than the maximum frame length supported on the interface. • For an Ethernet interface that does not permit jumbo frames, giants refer to frames larger than 1518 bytes (without VLAN tags) or 1522 bytes (with VLAN tags). • For an Ethernet interface that permits jumbo frames, giants refer to frames larger than the maximum length of Ethernet frames that are allowed to pass through, which is configured when you configure jumbo frame support on the interface.
throttles	Number of times the port is shut down due to buffer or CPU overload.
CRC	Total number of inbound frames that had a normal length, but contained CRC errors.
frame	Total number of inbound frames that contained CRC errors and a non-integer number of bytes.
overruns	Number of packets dropped because the input rate of the port exceeded the queuing capability.

Field	Description
aborts	Total number of illegal inbound packets: • **Fragment frames**—CRC error frames shorter than 64 bytes. The length can be an integral or non-integral value. • **Jabber frames**—CRC error frames greater than the maximum frame length supported on the Ethernet interface (with an integral or non-integral length). For an Ethernet interface that does not permit jumbo frames, jabber frames refer to CRC error frames greater than 1518 bytes (without VLAN tags) or 1522 bytes (with VLAN tags). For an Ethernet interface that permits jumbo frames, jabber frames refer to CRC error frames greater than the maximum length of Ethernet frames that are allowed to pass through the interface (which is configured when you configure jumbo frame support on the interface). • **Symbol error frames**—Frames that contained at least one undefined symbol. • **Unknown operation code frames**—Non-pause MAC control frames. • **Length error frames**—Frames whose 802.3 length fields did not match the actual frame length (46 to 1500 bytes).
ignored	Number of inbound frames dropped because the receive buffer of the port ran low.
parity errors	Total number of frames with parity errors.
Output(total): 0 packets, 0 bytes 0 unicasts, 0 broadcasts, 0 multicasts, 0 pauses	Outbound traffic statistics (in packets and bytes) for the interface. All outbound normal and abnormal packets and normal pause frames were counted. Number of outbound unicast packets, number of outbound broadcasts, number of outbound multicasts, and number of outbound pause frames. A hyphen (-) indicates that the statistical item is not supported.
Output(normal): 0 packets, 0 bytes 0 unicasts, 0 broadcasts, 0 multicasts, 0 pauses	Outbound normal traffic and pause frame statistics (in packets and bytes) for the interface. Number of outbound normal unicast packets, number of outbound normal broadcasts, number of outbound normal multicasts, and number of outbound normal pause frames. A hyphen (-) indicates that the statistical item is not supported.
output errors	Number of outbound packets with errors.
underruns	Number of packets dropped because the output rate of the interface exceeded the output queuing capability. This is a low-probability hardware anomaly.
buffer failures	Number of packets dropped because the transmit buffer of the interface ran low.
aborts	Number of packets that failed to be transmitted, for example, because of Ethernet collisions.
deferred	Number of frames that the interface deferred to transmit because of detected collisions.
collisions	Number of frames that the interface stopped transmitting because Ethernet collisions were detected during transmission.

Field	Description
late collisions	Number of frames that the interface deferred to transmit after transmitting their first 512 bits because of detected collisions.
lost carrier	Number of carrier losses during transmission. This counter increases by one when a carrier is lost, and applies to serial WAN interfaces.
no carrier	Number of times that the port failed to detect the carrier when attempting to send frames. This counter increases by one when a port failed to detect the carrier, and applies to serial WAN interfaces.

Display brief information about all interfaces.

```
<Sysname> display interface brief
The brief information of interface(s) under route mode:
Link: ADM - administratively down; Stby - standby
Protocol: (s) – spoofing

Interface            Link Protocol Main IP         Description
Eth1/0               UP   UP       10.1.1.2        Link to CoreRouter
Eth1/1               DOWN DOWN     --
Loop0                UP   UP(s)    2.2.2.9
NULL0                UP   UP(s)    --
Vlan1                UP   DOWN     --
Vlan999              UP   UP       192.168.1.42

The brief information of interface(s) under bridge mode:
Link: ADM - administratively down
Speed or Duplex: (a)/A - auto; H - half; F - full
Type: A - access; T - trunk; H - hybrid
Interface            Link Speed   Duplex Type PVID Description
Eth1/2               DOWN auto    A      A    1
Eth1/3               UP   100M(a) F(a)   A    1    aaa
Eth1/4               DOWN auto    A      A    1
Eth1/5               DOWN auto    A      A    1
Eth1/6               UP   100M(a) F(a)   A    1
Eth1/7               DOWN auto    A      A    1
Eth1/8               UP   100M(a) F(a)   A    1
Eth1/9               UP   100M(a) F(a)   A    999
```

Display brief information about interface Ethernet 1/3, including the full description of the interface.

```
<Sysname> display interface ethernet 1/3 brief description
The brief information of interface(s) under bridge mode:
Link: ADM - administratively down
Speed or Duplex: (a)/A - auto; H - half; F - full
Type: A - access; T - trunk; H - hybrid
Interface            Link Speed   Duplex Type PVID Description
Eth1/3               UP   100M(a) F(a)   A    1    aaa
```

Display information about interfaces in DOWN state and the causes.

```
<Sysname> display interface brief down
Brief information on interface(s) under route mode:
Link: ADM - administratively down; Stby - standby
Interface            Link Cause
Eth1/1               DOWN Not connected

Brief information on interface(s) under bridge mode:
Link: ADM - administratively down; Stby - standby
Interface            Link Cause
Eth1/2               DOWN Not connected
Eth1/4               DOWN Not connected
Eth1/5               DOWN Not connected
Eth1/7               DOWN Not connected
```

Table 6 Command output

Field	Description
The brief information of interface(s) under route mode:	Brief information about Layer 3 interfaces.
Link: ADM - administratively down; Stby - standby	• **ADM**—The interface has been shut down by the network administrator. To recover its physical layer state, run the **undo shutdown** command. • **Stby**—The interface is a standby interface.
Protocol: (s) – spoofing	If the network layer protocol of an interface is UP, but its link is an on-demand link or not present at all, this field displays **UP (s)**, where **s** represents the spoofing flag. This attribute is typical of interface Null 0 and loopback interfaces.
Interface	Interface name.
Link	Physical link state of the interface: • **UP**—The link is up. • **DOWN**—The link is physically down. • **ADM**—The link has been administratively shut down. To recover its physical state, run the **undo shutdown** command. • **Stby**—The interface is a standby interface.
Protocol	Link layer protocol state of the interface: • **UP**. • **DOWN**. • **UP(s)**—The link of the interface is an on-demand link or not present at all.
Description	Interface description configured by using the **description** command. If the **description** keyword is not specified in the **display interface brief** command, the Description field displays at most 27 characters. If the **description** keyword is specified in the **display interface brief** command, the field displays the full interface description.
The brief information of interface(s) under bridge mode:	Brief information about Layer 2 interfaces.

Field	Description
Speed or Duplex: (a)/A - auto; H - half; F – full	If the speed of an interface is automatically negotiated, its speed attribute includes the autonegotiation flag, indicated by the letter **a** in parentheses. If the duplex mode of an interface is automatically negotiated, its duplex mode attribute includes the following options: • **(a)/A**—Autonegotiation. • **H**—Half negotiation. • **F**—Full negotiation.
Type: A - access; T - trunk; H – hybrid	Link type options for Ethernet interfaces.
Speed	Interface rate, in bps.
Duplex	Duplex mode of the interface: • **A**—Autonegotiation. • **F**—Full duplex. • **F(a)**—Autonegotiated full duplex. • **H**—Half duplex. • **H(a)**—Autonegotiated half duplex.
Type	Link type of the interface: • **A**—Access. • **H**—Hybrid. • **T**—Trunk.
PVID	Port VLAN ID.
Cause	Cause for the physical link state of an interface to be **DOWN**: • **Administratively**—The port is manually shut down with the **shutdown** command. To restore the physical state of the interface, use the **undo shutdown** command. • **DOWN (Link-Aggregation interface down)**—When an aggregate interface is shut down, the physical state of all member ports of the aggregate interface become **DOWN**, and the **Cause** field displays **DOWN (Link-Aggregation interface down)**. • **DOWN (Loopback detection down)**—The port is shut down because the loopback detection module has detected loops. • **DOWN (Monitor-Link uplink down)**—The port is shut down because the monitor link module has detected that the uplink is down. • **Not connected**—No physical connection exists (possibly because the network cable is disconnected or faulty). • **STP DOWN**—The port is shut down by the STP BPDU guard function. • **Port Security Disabled**—The port is shut down by the intrusion detection mechanism because the port receives illegal packets. • **Standby**—The interface is in the Standby state.

Related commands

reset counters interface

display packet-drop

Use **display packet-drop** to display information about packets dropped on an interface or multiple interfaces.

Syntax

display packet-drop { **interface** [*interface-type* [*interface-number*]] | **summary** }

Views

Any view

Predefined user roles

network-admin

network-operator

Parameters

interface-type: Specifies an interface type. If you do not specify an interface type, this command displays information about dropped packets on all the interfaces on the device.

interface-number: Specifies an interface number. If you specify an interface type only, this command displays information about dropped packets on the specified type of interfaces.

summary: Displays the summary of dropped packets on all interfaces.

Examples

Display information about dropped packets on GigabitEthernet 1/1.

```
<Sysname> display packet-drop interface gigabitethernet 1/1
GigabitEthernet1/1:
Packets dropped due to full GBP or insufficient bandwidth: 301
Packets dropped due to Fast Filter Processor FFP: 261
Packets dropped due to STP non-forwarding state: 321
Packets dropped due to rate-limit: 143
Packets dropped due to broadcast-suppression: 301
Packets dropped due to unicast-suppression: 215
Packets dropped due to multicast-suppression: 241
Packets dropped due to Tx packet aging: 246
```

Display the summary of dropped packets on all interfaces.

```
<Sysname> display packet-drop summary
All interfaces:
  Packets dropped due to full GBP or insufficient bandwidth: 301
  Packets dropped due to FFP: 261
  Packets dropped due to STP non-forwarding state: 321
  Packets dropped due to rate-limit: 143
  Packets dropped due to broadcast-suppression: 301
  Packets dropped due to unicast-suppression: 215
  Packets dropped due to multicast-suppression: 241
  Packets dropped due to Tx packet aging: 246
```

Table 7 Command output

Field	Description
Packets dropped due to full GBP or insufficient bandwidth	Packets that are dropped because the buffer is used up or the bandwidth is insufficient.
Packets dropped due to Fast Filter Processor FFP	Packets that are filtered out.
Packets dropped due to STP non-forwarding state	Packets that are dropped because STP is in the non-forwarding state.
Packets dropped due to rate-limit	Packets that are dropped due to the rate limit set on the device.
Packets dropped due to broadcast-suppression	Packets that are dropped due to broadcast suppression.
Packets dropped due to unicast-suppression	Packets that are dropped due to unknown unicast suppression.
Packets dropped due to multicast-suppression	Packets that are dropped due to multicast suppression.
Packets dropped due to Tx packet aging	Outbound packets that are timed out.

duplex

Use **duplex** to set the duplex mode for an Ethernet interface.

Use **undo duplex** to restore the default duplex mode of the Ethernet interface.

Syntax

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

undo duplex

Default

A 10-GE interface operates in full duplex mode, and all other types of Ethernet interfaces operate in autonegotiation mode.

Views

Ethernet interface view

Predefined user roles

network-admin

Parameters

auto: Configures the interface to autonegotiate the duplex mode with the peer.

full: Configures the interface to operate in full duplex mode, so that the interface can receive and transmit packets at the same time.

half: Configures the interface to operate in half duplex mode, so that the interface can only receive or only transmit packets at one time.

Examples

Configure interface Ethernet 1/1 to operate in full duplex mode.

```
<Sysname> system-view
```

```
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] duplex full
```

flow-control

Use **flow-control** to enable TxRx mode generic flow control on an Ethernet interface.

Use **undo flow-control** to disable generic flow control on the Ethernet interface.

Syntax

flow-control

undo flow-control

Default

Generic flow control is disabled on an Ethernet interface.

Views

Ethernet interface view

Predefined user roles

network-admin

Usage guidelines

To implement flow control on a link, enable the generic flow control function at both ends of the link.

TxRx mode generic flow control enables an Ethernet interface to receive common pause frames from its peer, and send common pause frames to notify its peer of congestions.

With the **flow-control** command configured, an interface can both send and receive flow control frames:

- When congested, the interface sends a flow control frame to its peer.
- Upon receiving a flow control frame from the peer, the interface suspends sending packets.

Examples

Enable TxRx mode generic flow control on the interface Ethernet 1/1.

```
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] flow-control
```

flow-interval

Use **flow-interval** to set the interface statistics polling interval.

Use **undo flow-interval** to restore the default interval.

Syntax

flow-interval *interval*

undo flow-interval

Default

The interface statistics polling interval is 300 seconds.

Views

System view

Predefined user roles

network-admin

Parameters

interval: Sets the statistics polling interval, in seconds. The interval is in the range of 5 to 300 and must be a multiple of 5.

Usage guidelines

Settings in system view take effect on all Ethernet interfaces.

Examples

Set the interface statistics polling interval to 100 seconds.

```
<Sysname> system-view
[Sysname] flow-interval 100
```

interface

Use **interface** to enter interface or subinterface view. With the *interface-number.subnumber* argument specified, if the subinterface identified by the argument does not exist, this command creates the subinterface first, and then enters subinterface view.

Syntax

interface *interface-type* { *interface-number* | *interface-number.subnumber* }

Views

System view

Predefined user roles

network-admin

Parameters

interface-type: Specifies an interface type.

interface-number: Specifies an interface number.

interface-number.subnumber: Specifies a subinterface number, where *interface-number* is an interface number, and *subnumber* is the number of a subinterface created under the interface. The value range for the *subnumber* argument is 1 to 4094.

Examples

Enter Ethernet 1/1 interface view.

```
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1]
```

Create Ethernet subinterface Ethernet 1/1.1 and enter Ethernet 1/1.1 subinterface view.

```
<Sysname> system-view
[Sysname] interface ethernet 1/1.1
[Sysname-Ethernet1/1.1]
```

jumboframe enable

Use **jumboframe enable** to allow jumbo frames within the specified length to pass through.

Use **undo jumboframe enable** to prevent jumbo frames from passing through.

Syntax

jumboframe enable [*value*]

undo jumboframe enable

Default

The device allows jumbo frames within a specified length to pass through. The length of jumbo frames that are allowed to pass through varies by interface type.

Views

Layer 2 Ethernet interface view, Layer 3 Ethernet interface view

Predefined user roles

network-admin

Parameters

value: Sets the maximum length of Ethernet frames that are allowed to pass through.

Usage guidelines

If you set the *value* argument multiple times, the most recent configuration takes effect.

Examples

Enable jumbo frames to pass through Ethernet 1/1.

```
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] jumboframe enable
```

loopback

Use **loopback** to perform a loopback test on an Ethernet interface.

Use **undo loopback** to cancel a loopback test on an Ethernet interface.

Syntax

loopback internal

undo loopback

Views

Ethernet interface view

Predefined user roles

network-admin

Parameters

internal: Performs an internal loopback test on the Ethernet interface.

Usage guidelines

If an Ethernet interface does not work correctly, you can perform an internal loopback test on it to test all on-chip functions related to the interface.

An Ethernet interface in a loopback test does not forward data traffic.

On a physically down interface (displayed as in **DOWN** state), you can perform an internal loopback test. On an administratively shut down interface (displayed as in **ADM** or **Administratively DOWN** state), you cannot perform an internal loopback test.

The **speed**, **duplex**, **mdi**, and **shutdown** commands are not available during a loopback test.

During a loopback test, the Ethernet interface operates in full duplex mode. When the loopback test is complete, the port returns to its duplex setting.

Examples

Perform an internal loopback test on Ethernet 1/1.

```
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] loopback internal
```

port link-mode

Use **port link-mode** to change the link mode of an Ethernet interface.

Use **undo port link-mode** to restore the default.

Syntax

port link-mode { **bridge** | **route** }

undo port link-mode

Default

Only Ethernet interfaces on SIC-4FSW and DSIC-9FSW cards operate in bridge mode.

Views

Ethernet interface view

Predefined user roles

network-admin

Parameters

bridge: Specifies the Layer 2 mode.

route: Specifies the Layer 3 mode.

Usage guidelines

Ethernet interfaces on the device can operate either as Layer 2 or Layer 3 Ethernet interfaces (you can use commands to set the link mode to bridge or route).

After you change the link mode of an Ethernet interface, all the commands (except the **shutdown** command) on the Ethernet interface are restored to their defaults in the new link mode.

Examples

Configure Ethernet 1/1 to operate in bridge mode.

```
<Sysname> system-view
```

```
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] port link-mode bridge
```

reset counters interface

Use **reset counters interface** to clear the Ethernet interface or subinterface statistics.

Syntax

reset counters interface [*interface-type* [*interface-number* | *interface-number.subnumber*]]

Views

User view

Predefined user roles

network-admin

Parameters

interface-type: Specifies an interface type.

interface-number: Specifies an interface number.

interface-number.subnumber: Specifies a subinterface number, where *interface-number* is an interface number; *subnumber* is the number of a subinterface created under the interface. The value range for the *subnumber* argument is 1 to 4094.

Usage guidelines

Before collecting traffic statistics for a specific period of time on an interface, clear the old statistics first.

If no interface type is specified, this command clears statistics for all interfaces.

If only the interface type is specified, this command clears statistics for all interfaces of that type.

If both the interface type and the interface or subinterface number are specified, this command clears statistics for the specified interface or subinterface.

Examples

Clear the statistics of Ethernet 1/1.

```
<Sysname> reset counters interface ethernet 1/1
```

Related commands

- **display interface**
- **display counters interface**
- **display counters rate interface**

reset ethernet statistics

Use **reset ethernet statistics** to clear the Ethernet statistics.

Syntax

MSR2000/MSR3000:

reset ethernet statistics

MSR4000:

reset ethernet statistics slot *slot-number*

Views

User view

Predefined user roles

network-admin

network-operator

Parameters

slot *slot-number*: Clears the Ethernet statistics on the specified card. The *slot-number* argument represents the number of the slot that houses the card. (MSR4000)

Examples

Clear the Ethernet statistics. (MSR2000/MSR3000)

```
<Sysname> reset ethernet statistics
```

Clear the Ethernet statistics on slot 2. (MSR4000)

```
<Sysname> reset ethernet statistics slot 2
```

reset packet-drop interface

Use **reset packet-drop interface** to clear the dropped packet statistics on an interface or multiple interfaces.

Syntax

reset packet-drop interface [*interface-type* [*interface-number*]]

Views

User view

Predefined user roles

network-admin

Parameters

interface-type: Specify an interface type. If you do not specify an interface type, this command clears dropped packet statistics on all the interfaces on the device.

interface-number: Specify an interface number. If you do not specify this argument, this command clears dropped packet statistics on all interfaces of the specified type.

Examples

Clear dropped packet statistics on GigabitEthernet 1/1.

```
<Sysname> reset packet-drop interface GigabitEthernet 1/1
```

Clear dropped packet statistics on all interfaces.

```
<Sysname> reset packet-drop interface
```

Related commands

display packet-drop

shutdown

Use **shutdown** to shut down an Ethernet interface or subinterface.

Use **undo shutdown** to bring up an Ethernet interface or subinterface.

Syntax

shutdown

undo shutdown

Default

An Ethernet interface or subinterface is in down state.

Views

Ethernet interface view, Ethernet subinterface view

Predefined user roles

network-admin

Usage guidelines

You might need to shut down and then bring up an Ethernet interface to make some interface configurations take effect.

Examples

Shut down and then bring up Ethernet 1/1.

```
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] shutdown
[Sysname-Ethernet1/1] undo shutdown
```

Shut down and then bring up Ethernet 1/1.1.

```
<Sysname> system-view
[Sysname] interface ethernet 1/1.1
[Sysname-Ethernet1/1.1] shutdown
[Sysname-Ethernet1/1.1] undo shutdown
```

speed

Use **speed** to set the speed of an Ethernet interface.

Use **undo speed** to restore the default.

Syntax

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

undo speed

Default

An Ethernet interface negotiates a speed with its peer.

Views

Ethernet interface view

Predefined user roles

network-admin

Parameters

10: Sets the interface speed to 10 Mbps.

100: Sets the interface speed to 100 Mbps.

1000: Sets the interface speed to 1000 Mbps.

10000: Sets the interface speed to 10000 Mbps. This keyword is supported only on 10-GE interfaces of an MSR4000 router.

auto: Enables the interface to negotiate a speed with its peer.

Usage guidelines

For an Ethernet copper port, use the **speed** command to set its speed to match the speed of the peer interface.

For an optical port, use the **speed** command to set its speed to match the rate of a transceiver module.

Examples

Configure Ethernet 1/1 to autonegotiate the speed.

```
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] speed auto
```

Related commands

speed auto

Layer 2 Ethernet interface commands

broadcast-suppression

Use **broadcast-suppression** to enable broadcast suppression and set the broadcast suppression threshold.

Use **undo broadcast-suppression** to restore the default.

Syntax

broadcast-suppression { *ratio* | **pps** *max-pps* | **kbps** *max-kbps* }

undo broadcast-suppression

Default

Ethernet interfaces do not suppress broadcast traffic.

Views

Layer 2 Ethernet interface view

Predefined user roles

network-admin

Parameters

ratio: Sets the broadcast suppression threshold as a percentage of the maximum interface rate. The value range for this argument is 0 to 100. The smaller the percentage, the less broadcast traffic is allowed to pass through.

pps *max-pps*: Specifies the maximum number of broadcast packets that the interface can forward per second. The value range for the *max-pps* argument (in pps) is 1 to 1.4881 × the maximum interface rate. For example, the value range for this argument is 1 to 1488100 on a GE interface.

kbps *max-kbps*: Specifies the maximum number of kilobits of broadcast traffic that the Ethernet interface can forward per second. The value range for this argument (in kbps) is 1 to the maximum interface rate.

Usage guidelines

You can use the broadcast storm suppression function to limit the size of broadcast traffic on an interface. When the broadcast traffic on the interface exceeds this threshold, the system drops packets until the traffic drops below this threshold.

When you configure the suppression threshold in pps or kbps, the device might convert the configured value into a multiple of a certain step supported by the chip. As a result, the actual suppression threshold might be different from the configured one. To determine the suppression threshold that takes effect, see the prompts on the device.

Examples

Set the broadcast suppression threshold to 10000 kbps on Ethernet 1/1.

```
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] broadcast-suppression kbps 10000
```

Related commands

- **multicast-suppression**
- **unicast-suppression**

mac-address

Use **mac-address** to configure the MAC address of an Ethernet interface.

Use **undo mac-address** to restore the default.

Syntax

mac-address *mac-address*

undo mac-address

Views

Layer 2 Ethernet interface view

Predefined user roles

network-admin

Parameters

mac-address: Specifies a MAC address, in the format of H-H-H.

Examples

Configure the MAC address of Layer 2 Ethernet interface Ethernet 1/1 as 0001-0001-0001.

```
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] mac-address 1-1-1
```

mdix-mode

IMPORTANT:

Fiber ports do not support this command.

Use **mdix-mode** to configure the Medium Dependent Interface Cross-Over (MDIX) mode of an Ethernet interface.

Use **undo mdix-mode** to restore the default.

Syntax

mdix-mode { **automdix** | **mdi** | **mdix** }

undo mdix-mode

Default

Ethernet interfaces operate in **automdix** mode.

Views

Layer 2 Ethernet interface view

Predefined user roles

network-admin

Parameters

automdix: Specifies that the interface negotiates pin roles with its peer.

mdi: Specifies that pins 1 and 2 are transmit pins and pins 3 and 6 are receive pins.

mdix: Specifies that pins 1 and 2 are receive pins and pins 3 and 6 are transmit pins.

Examples

Set Ethernet 1/1 to operate in MDI mode.

```
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] mdix-mode mdi
```

multicast-suppression

Use **multicast-suppression** to enable multicast storm suppression and set the multicast storm suppression threshold.

Use **undo multicast-suppression** to restore the default.

Syntax

multicast-suppression { *ratio* | **pps** *max-pps* | **kbps** *max-kbps* }

undo multicast-suppression

Default

Ethernet interfaces do not suppress multicast traffic.

Views

Layer 2 Ethernet interface view

Predefined user roles

network-admin

Parameters

ratio: Sets the multicast suppression threshold as a percentage of the maximum interface rate. The value range for this argument (in percentage) is 0 to 100. The smaller the percentage, the less multicast traffic is allowed to pass through.

pps *max-pps*: Specifies the maximum number of multicast packets that the interface can forward per second. The value range for the *max-pps* argument (in pps) is 1 to 1.4881 × the maximum interface rate. For example, the value range for this argument is 1 to 1488100 on a GE interface.

kbps *max-kbps*: Specifies the maximum number of kilobits of multicast traffic that the Ethernet interface can forward per second. The value range for this argument (in kbps) is 1 to the maximum interface rate.

Usage guidelines

You can use the multicast storm suppression function to limit the size of multicast traffic on an interface. When the multicast traffic on the interface exceeds this threshold, the system drops packets until the traffic drops below this threshold.

When you configure the suppression threshold in pps or kbps, the device might convert the configured value into a multiple of a certain step supported by the chip. As a result, the actual suppression threshold might be different from the configured one. To determine the suppression threshold that takes effect, see the prompts on the device.

Examples

Set the multicast storm suppression threshold to 10000 kbps on Ethernet 1/1.

```
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] multicast-suppression kbps 10000
```

Related commands

- **broadcast-suppression**
- **unicast-suppression**

unicast-suppression

Use **unicast-suppression** to enable unicast storm suppression and set the unicast storm suppression threshold.

Use **undo unicast-suppression** to restore the default.

Syntax

unicast-suppression { *ratio* | **pps** *max-pps* | **kbps** *max-kbps* }

undo unicast-suppression

Default

Ethernet interfaces do not suppress unicast traffic.

Views

Layer 2 Ethernet interface view

Predefined user roles

network-admin

Parameters

ratio: Sets the unicast suppression threshold as a percentage of the maximum interface rate. The value range for this argument (in percentage) is 0 to 100. The smaller the percentage, the less unicast traffic is allowed to pass through.

pps *max-pps*: Specifies the maximum number of unicast packets that the interface can forward per second. The value range for the *max-pps* argument (in pps) is 1 to 1.4881 × the maximum interface rate. For example, the value range for the argument is 1 to 1488100 on a GE interface.

kbps *max-kbps*: Specifies the maximum number of kilobits of unicast traffic that the Ethernet interface can forward per second. The value range for this argument (in kbps) is 1 to the maximum interface rate.

Usage guidelines

You can use the unicast storm suppression function to limit the size of unicast traffic on an interface. When the unicast traffic on the interface exceeds this threshold, the system discards packets until the unicast traffic drops below this threshold.

When you configure the suppression threshold in pps or kbps, the device might convert the configured value into a multiple of a certain step supported by the chip. As a result, the actual suppression threshold might be different from the configured one. To determine the suppression threshold that takes effect, see the prompts on the device.

Examples

Set the unicast storm suppression threshold to 10000 kbps on Ethernet 1/1.

```
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] unicast-suppression kbps 10000
```

Related commands

- **broadcast-suppression**
- **multicast-suppression**

Layer 3 Ethernet interface or subinterface commands

mac-address

Use **mac-address** to configure the MAC address of an Ethernet interface.

Use **undo mac-address** to restore the default.

Syntax

mac-address *mac-address*

undo mac-address

Views

Layer 3 Ethernet interface view

Predefined user roles

network-admin

Parameters

mac-address: Specifies a MAC address in the format of H-H-H.

Usage guidelines

When you use the **mac-address** command to configure a MAC address for a Layer 3 Ethernet subinterface, select a MAC address different from that of the host interface.

Do not configure a VRRP-reserved MAC address for a Layer 3 Ethernet subinterface.

Examples

Configure the MAC address of Layer 3 Ethernet interface Ethernet 1/1 as 0001-0001-0001.

```
<Sysname> system-view
[Sysname] interface ethernet 2/1
[Sysname-Ethernet2/1] mac-address 1-1-1
```

mtu

Use **mtu** to set the MTU for an Ethernet interface or subinterface.

Use **undo mtu** to restore the default.

Syntax

mtu *size*

undo mtu

Default

The MTU of an Ethernet interface or subinterface is 1500 bytes.

Views

Layer 3 Ethernet interface view, Layer 3 Ethernet subinterface view

Predefined user roles

network-admin

Parameters

size: Sets the maximum transmission unit (MTU) in the range of 46 to 1560 bytes.

The following matrix shows the value ranges for the *size* argument on different MSR routers:

Argument	MSR2000	MSR3000	MSR4000
size	46 to 1560	46 to 1560	• On Layer 3 Ethernet interfaces and subinterfaces: 46 to 1560 • On 10-GE interfaces: 46 to 9600

Usage guidelines

As the MTU size decreases, the number of fragments grows. When you set the MTU for an interface, you should consider QoS queue lengths (for example, the default FIFO queue length is 75) to prevent a too small MTU from causing packet drops in QoS queuing. To achieve the best result, you can tune the MTU with the **mtu** command or tune QoS queue lengths with the **qos fifo queue-length** command. For more information about the **qos fifo queue-length** command, see *ACL and QoS Command Reference*.

Examples

Set the MTU to 1430 bytes for Layer 3 Ethernet interface Ethernet 2/1.

```
<Sysname> system-view
[Sysname] interface ethernet 2/1
[Sysname-Ethernet2/1] mtu 1430
```

Set the MTU to 1400 bytes for Layer 3 Ethernet subinterface Ethernet 2/1.1.

```
<Sysname> system-view
[Sysname] interface ethernet 2/1.1
[Sysname-Ethernet2/1.1] mtu 1430
```

WAN interface configuration commands

Common WAN interface configuration commands

bandwidth

Use **bandwidth** to configure the expected bandwidth of an interface.

Use **undo bandwidth** to restore the default.

Syntax

bandwidth *bandwidth-value*

undo bandwidth

Default

The expected bandwidth (in kbps) is the interface baud rate divided by 1000.

Views

Serial interface view, serial sub interface view, AM interface view, ,ISDN BRI interface view, E1-F interface view, T1-F interface view, CE1/PRI interface view, CT1/PRI interface view, MP interface view, VT interface view, CE3 interface view

Predefined user roles

network-admin

Parameters

bandwidth-value: Specifies the expected bandwidth in the range of 1 to 400000000 kbps.

Usage guidelines

The expected bandwidth of an interface affects the following items:

- Bandwidth assignment with CBQ. For more information, see *ACL and QoS Configuration Guide*.
- Link costs in OSPF, OSPFv3, and IS-IS. For more information, see *Layer 3—IP Routing Configuration Guide*.

Examples

Set the expected bandwidth of Serial 2/0 to 50 kbps.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] bandwidth 50
```

default

Use **default** to restore the default settings for the interface.

Syntax

default

Views

Serial interface view, serial sub interface view, AM interface view, ISDN BRI interface view, E1-F interface view, T1-F interface view, CE3 interface view, CE1/PRI interface view, CT1/PRI interface view

Predefined user roles

network-admin

Usage guidelines

CAUTION:

The **default** command might interrupt ongoing network services. Make sure you are fully aware of the impacts of this command when you perform it on a live network.

This command might fail to restore the default settings for some commands for reasons such as command dependencies and system restrictions. You can use the **display this** command in interface view to check for these commands, and perform their **undo** forms or follow the command reference to individually restore their default settings. If your restoration attempt still fails, follow the error message instructions to resolve the problem.

Examples

Restore the default settings of serial interface serial 2/0.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] default
```

description

Use **description** to set the description for the interface.

Use **undo description** to restore the default.

Syntax

description *text*

undo description

Default

The description of a WAN interface is *interface name* Interface, for example, Serial2/0 Interface.

Views

Serial interface view, serial sub interface view, AM interface view, ISDN BRI interface view, E1-F interface view, T1-F interface view, CE3 interface view, CE1/PRI interface view, CT1/PRI interface view

Predefined user roles

network-admin

Parameters

text: Interface description, a case-sensitive string of 1 to 255 characters.

Examples

Set the description for serial interface Serial 2/0 to **router-interface**.

```
<Sysname> system-view
[Sysname] interface serial 2/0
```

```
[Sysname-Serial2/0] description router-interface
```

shutdown

Use **shutdown** to shut down an interface.

Use **undo shutdown** to bring up an interface.

Syntax

shutdown

undo shutdown

Default

A WAN interface is up.

Views

Serial interface view, serial sub interface view, AM interface view, ISDN BRI interface view, E1-F interface view, T1-F interface view, CE3 interface view, CE1/PRI interface view, CT1/PRI interface view

Predefined user roles

network-admin

Examples

Shut down serial interface Serial 2/0.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] shutdown
```

timer-hold

Use **timer-hold** to set the polling interval, the interval at which an interface sends keepalive packets.

Use **undo timer-hold** to restore the default.

Syntax

timer-hold *seconds*

undo timer-hold

Default

The polling interval is 10 seconds.

Views

Serial interface view, AM interface view, ISDN BRI interface view, E1-F interface view, T1-F interface view

Predefined user roles

network-admin

Parameters

seconds: Interval at which an interface sends keepalive packets, in the range of 0 to 32767 seconds.

Usage guidelines

If the upper layer protocol of an interface is PPP, FR, or HDLC, the link layer sends keepalive packets to the peer. If it cannot receive any keepalive packets sent by the peer, the link layer considers the peer is faulty and shuts down the interface. You can use this command to modify the interval at which the interface sends keepalive packets.

Configure a reasonable value for the interval on a low-speed link. A too small value might cause frequent interface shutdown because keepalive packet sending and receiving might be delayed when large packets are transmitted.

Examples

Set the polling interval to 15 seconds for interface serial 2/0.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] timer-hold 15
```

Synchronous, asynchronous, and synchronous/asynchronous serial interface configuration commands

async-mode

Use **async-mode** to set the operating mode for an asynchronous serial interface.

Use **undo async-mode** to restore the default.

Syntax

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

undo async-mode

Default

An asynchronous serial interface operates in protocol mode.

Views

Asynchronous serial interface view, synchronous/asynchronous interface view

Predefined user roles

network-admin

Parameters

flow: Configures the interface to operate in flow mode, or interactive mode. In this mode, the two ends interact attempting to set up a link after the physical link is set up. During this process, the calling party sends configuration commands to the called party (this is equal to the operation of manually inputting configuration commands at the remote end), sets the link layer protocol operating parameters of the called party, and then sets up the link. This approach applies to man-machine interactions such as dial-in access.

protocol: Configures the interface to operate in protocol mode. In this mode, the interface uses configured link layer protocol parameters to set up a link with the remote end after its physical link is established.

Usage guidelines

You can configure this command for a synchronous/asynchronous interface only after you change the mode of the interface to asynchronous mode with the **physical-mode async** command. You can configure PPP when the asynchronous serial interface is operating in flow mode, but the configuration does not take effect. The PPP configuration takes effect only after you change the operating mode of the interface to **protocol**.

Examples

Configure asynchronous serial interface Async 6/4/0 to operate in flow mode.

```
<Sysname> system-view
[Sysname] interface async 6/4/0
[Sysname-Async6/4/0] async-mode flow
```

Configure synchronous/asynchronous serial interface Serial 2/0 to operate in flow mode.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] async-mode flow
```

Related commands

physical-mode

baudrate

Use **baudrate** to set the baud rate for a synchronous serial interface.

Use **undo baudrate** to restore the default.

Syntax

baudrate *baudrate*

undo baudrate

Default

The baud rate is 64000 bps on a synchronous serial interface.

Views

Synchronous serial interface view

Predefined user roles

network-admin

Parameters

baudrate: Baud rate (in bps) to be set for a serial interface.

Usage guidelines

The following are the baud rates (in bps) available for synchronous serial interfaces:

1200, 2400, 4800, 9600, 19200, 38400, 56000, 57600, 64000, 72000, 115200, 128000, 192000, 256000, 384000, 512000, 1024000, 2048000, and 4096000.

When you specify a baud rate for a synchronous serial interface, you must make sure the baud rate matches the cable type.

- For V.24 DTE/DCE, set the baud rate in the range of 1200 bps to 64000 bps.
- For V.35 DCE/DCE, X.21 DTE/DCE, EIA/TIA-449 DTE/DCE, and EIA-530 DTE/DCE, set the baud rate in the range of 1200 bps to 4096000 bps.

The baud rate adopted by a DCE-DTE pair is determined by the DCE.

Examples

Set the baud rate of synchronous serial interface 2/0 at DCE side to 115200 bps.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] baudrate 115200
```

Related commands

virtualbaudrate

clock

Use **clock** to set the clock selection mode for a synchronous serial interface.

Use **undo clock** to restore the default.

Syntax

clock { **dteclk1** | **dteclk2** | **dteclk3** | **dteclk4** | **dteclk5** | **dteclkauto** }

undo clock

Default

The DTE-side clock is **dteclk1** and the DCE-side clock is **dceclk1**.

Views

Synchronous serial interface view

Predefined user roles

network-admin

Parameters

dteclk1: Sets the interface clock selection mode to DTE clock option 1.

dteclk2: Sets the interface clock selection mode to DTE clock option 2.

dteclk3: Sets the interface clock selection mode to DTE clock option 3.

dteclk4: Sets the interface clock selection mode to DTE clock option 4.

dteclk5: Sets the interface clock selection mode to DTE clock option 5.

dteclkauto: Sets the interface clock selection mode to DTE auto-negotiation.

dceclk1: Sets the interface clock selection mode to DCE clock option 1.

dceclk2: Sets the interface clock selection mode to DCE clock option 2.

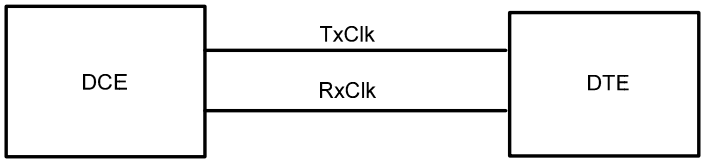
dceclk3: Sets the interface clock selection mode to DCE clock option 3.

Usage guidelines

A synchronous serial interface can operate as a DCE or DTE.

- As a DCE, the interface provides DCEclk clock to the DTE.
- As a DTE, the interface accepts the clock provided by the DCE. Because transmitting and receiving clocks of synchronization devices are independent, the receiving clock of a DTE device can be either the transmitting or receiving clock of the DCE device, so is the transmitting clock. Therefore, five clock options are available for a DTE device.

Figure 1 Selecting a clock for a synchronous serial interface



In the figure, "TxClk" represents transmitting clock, and "RxClk" represents receiving clock.

Table 8 describes the four clock selection options for a synchronous serial interface operating as a DTE and a DCE, respectively.

Table 8 Clock options available for a synchronous serial interface operating as a DTE

Clock selection option	Description
DTEclk1	TxClk = TxClk, RxClk = RxClk.
DTEclk2	TxClk = TxClk, RxClk = TxClk.
DTEclk3	TxClk = RxClk, RxClk = TxClk.
DTEclk4	TxClk = RxClk, RxClk = RxClk.
DTEclk5	TxClk = Local, RxClk = Local.

In the table, the clock preceding the equal sign (=) is the DTE clock and the one that follows is the DCE clock.

Table 9 Clock options available for a synchronous serial interface operating as a DCE

Clock selection option	Description
DCEclk1	TxClk = Local, RxClk = Local.
DCEclk2	TxClk = Local, RxClk = Line.
DCEclk3	TxClk = Line, RxClk = Line.

In the table, the clock preceding the equal sign (=) is the DCE clock and the one that follows is the clock signal source.

Examples

Set the synchronous serial interface operating as a DTE to use the clock selection option **dteclk2**.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] clock dteclk2
```

code

Use **code** to configure the digital signal coding format on a synchronous serial interface.

Use **undo code** to restore the default.

Syntax

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

undo code

Default

The digital signal coding format is NRZ.

Views

Synchronous serial interface view

Predefined user roles

network-admin

Parameters

nrz: Sets the digital signal coding format to nonreturn to zero (NRZ).

nrzi: Sets the digital signal coding format to nonreturn to zero inverted (NRZI).

Examples

Set the digital signal coding format to **nrzi** on synchronous serial interface 2/0.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] code nrzi
```

crc

Use **crc** to set the CRC mode for a synchronous serial interface.

Use **undo crc** to restore the default.

Syntax

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

undo crc

Default

16-bit CRC is adopted.

Views

Synchronous serial interface view

Predefined user roles

network-admin

Parameters

16: Specifies 16-bit CRC.

32: Specifies 32-bit CRC.

none: Disables CRC.

Examples

Configure synchronous serial interface Serial 2/0 to adopt 32-bit CRC.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] crc 32
```

detect dcd

Use **detect dcd** to enable data carrier detection (DCD) on a serial interface.

Use **undo detect dcd** to disable DCD on a serial interface.

Syntax

detect dcd

undo detect dcd

Default

DCD is enabled on a serial interface.

Views

Synchronous serial interface view

Predefined user roles

network-admin

Usage guidelines

When determining whether a synchronous serial interface is up or down, the system detects by default the DSR signal, DCD signal, and presence of cable connection. The interface is considered as up only when the three signals are all valid.

Examples

Enable DCD on synchronous serial interface Serial 2/0.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] detect dcd
```

Related commands

detect dsr-dtr

detect dsr-dtr

Use **detect dsr-dtr** to enable level detection on a serial interface, or detection on data set ready (DSR) and data terminal ready (DTR) signals of data service unit/channel service unit (DSU/CSU).

Use **undo detect dsr-dtr** to disable level detection on a serial interface.

Syntax

detect dsr-dtr

undo detect dsr-dtr

Default

Level detection is enabled on a serial interface.

Views

Synchronous serial interface view, asynchronous interface view, synchronous/asynchronous interface view

Predefined user roles

network-admin

Usage guidelines

If level detection is disabled on an asynchronous serial interface, the system automatically reports that the state of the serial interface is up with both DTR and DSR being up without detecting whether a cable is connected. If level detection is enabled on the interface, the system detects the DSR signal in addition to the external cable. The interface is regarded as up only when the detected DSR signal is valid. Otherwise, it is regarded down.

By default, the system places a synchronous serial interface in up state only when it detects the correct DSR signal, DCD signal, and cable connection. The system shuts down the interface if it fails to detect any of these items. If level detection is disabled, the system places the interface , DTR, and DSR in up state when it detects a cable connection.

Examples

Enable DCD on synchronous serial interface Serial 2/0.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] detect dsr-dtr
```

Enable DCD on asynchronous serial interface Async 6/4/0.

```
<Sysname> system-view
[Sysname] interface async 6/4/0
[Sysname-Async6/4/0] detect dsr-dtr
```

Related commands

detect dcd

display interface async

Use **display interface async** to display information about an asynchronous interface.

Syntax

display interface [**async**] [**brief** [**down** | **description**]]

display interface [**async** [*interface-number*]] [**brief** [**description**]]

Views

Any view

Predefined user roles

network-admin

network-operator

Parameters

interface-number: Specifies an asynchronous interface by its number.

brief: Displays brief interface information. If you do not specify this keyword, the command displays detailed interface information.

down: Displays information about interfaces in physically DOWN state and the causes. If you do not specify this keyword, the command displays information about interfaces in all states.

description: Displays complete interface descriptions. If you do not specify this keyword, the command displays only the first 27 characters of interface descriptions.

Usage guidelines

If you do not specify the **async** keyword, this command displays information about all interfaces on the device.

If you specify the **async** keyword without the *interface-number* argument, this command displays information about all existing asynchronous interfaces.

Examples

Display detailed information about asynchronous interface Async 6/4/0.

```
<Sysname> display interface async 6/4/0
Async6/4/0
Current state: DOWN
Line protocol state: DOWN
Description: Async6/4/0 Interface
Bandwidth: 9kbps
Maximum Transmit Unit: 1500
Hold timer: 10 seconds
Internet protocol processing: disabled
Link layer protocol: PPP
LCP: initial
Last clearing of counters: Never
Physical layer: asynchronous, Baudrate: 9600 bps
Output queue: (Urgent queuing: Size/Length/Discards) 0/100/0
Output queue: (Protocol queuing: Size/Length/Discards) 0/500/0
Output queue: (FIFO queuing: Size/Length/Discards) 0/75/0
Last 300 seconds input rate: 0.00 bytes/sec, 0 bits/sec, 0.00 packets/sec
Last 300 seconds output rate: 0.00 bytes/sec, 0 bits/sec, 0.00 packets/sec
Input:
  1 packets, 0 bytes
  0 broadcasts, 0 multicasts
  1 errors, 0 runts, 0 giants
  0 crc, 0 align errors, 0 overruns
  0 aborts, 0 no buffers
  1 frame errors
Output:
  0 packets, 0 bytes
  0 errors, 0 underruns, 0 collisions
  0 deferred
DCD: DOWN, DTR: UP, DSR: DOWN, RTS: UP, CTS: DOWN
```

Display brief information about interface Async 6/4/0.

```
<Sysname> display interface async 6/4/0 brief
Brief information on interface(s) under route mode:
Link: ADM - administratively down; Stby - standby
Protocol: (s) - spoofing
Interface            Link Protocol Main IP         Description
Asy6/4/0             DOWN DOWN     --
```

Display brief information about all asynchronous interfaces in physically DOWN state.

```
<Sysname> display interface async brief down
Brief information on interface(s) under route mode:
Link: ADM - administratively down; Stby - standby
Interface            Link Cause
Asy6/4/0             ADM  Administratively
```

Table 10 Command output

Field	Description
Async6/4/0 Current state	Physical state of the asynchronous interface: • **DOWN (Administratively)**—The interface has been shut down with the **shutdown** command. • **DOWN**—The interface is physically shut down because no physical link is present or the physical link has failed. • **UP**—The interface is both administratively and physically up.
Line protocol current state	Link protocol state of the interface.
Description	Description for the interface.
Bandwidth	Intended bandwidth of the interface.
Maximum Transmit Unit	Maximum Transmission Unit (MTU) of the interface.
Hold timer	Interval at which the interface sends keepalive packets.
Internet protocol processing	Network layer protocol processing state.
Link layer protocol PPP	Link layer protocol of the interface.
LCP initial	LCP has been successfully initialized.
Last clearing of counters	Time when the **reset counters interface** command was last executed. If the device has never executed the **reset counters interface** command, the field displays **Never**.
Physical layer	Physical layer state.
Baudrate	Baudrate of the interface.
Output queue : (Urgent queue : Size/Length/Discards) Output queue : (Protocol queue : Size/Length/Discards) Output queue : (FIFO queuing : Size/Length/Discards)	Output queue of the interface: • Packet statistics for urgent queuing. • Packet statistics for protocol queuing. • Packet statistics for FIFO queuing.
Last 300 seconds input rate: 0.00 bytes/sec, 0 bits/sec, 0.00 packets/sec	Average input rate in the last 300 seconds.

Field	Description
Last 300 seconds output rate: 0.00 bytes/sec, 0 bits/sec, 0.00 packets/sec	Average output rate in the last 300 seconds.
Input: 1 packets, 0 bytes 0 broadcasts, 0 multicasts 1 errors, 0 runts, 0 giants 0 crc, 0 align errors, 0 overruns 0 aborts, 0 no buffers 1 frame errors	Received statistics on the AM interface: • **broadcasts**—Number of received broadcast packets. • **multicasts**—Number of received multicast packets. • **errors**—Number of error packets detected on the physical layer. • **runts**—Number of undersized packets received on the interface. • **giants**—Number of oversized packets received on the interface. • **crc**—Number of normal-sized packets with CRC errors received on the interface. • **align errors**—Number of packets with alignment errors received on the interface. • **overruns**—Number of packets dropped because the input rate of the interface exceeded the queuing capability. • **aborts**—Number of packets that are not received successfully. • **no buffers**—Number of packets that are discarded because the buffer runs out. • **frame errors**—Number of packets with frame errors.
Output: 0 packets, 0 bytes 0 errors, 0 underruns, 0 collisions 0 deferred	Sent statistics on the AM interface: • **errors**—Number of error packets detected at the physical layer. • **underruns**—Number of packets that fail to be forwarded because the interface reads from memory at a slower speed than it forwards packets. • **collisions**—Number of packets with collisions detected. • **deferred**—Number of deferred or timeout packets.
DCD: DOWN, DTR: UP, DSR: DOWN, RTS: UP, CTS: DOWN	Status of Data Carrier Detect (DCD), Data Terminal Ready (DTR), Data Set Ready (DSR), Request to Send (RTS), and Clear to Send (CTS) signals. For more information about DSR, DTR, and DCD, see the detect dcd command.
Brief information on interface(s) under route mode	Brief information about Layer 3 interfaces.
Link: ADM - administratively down; Stby - standby	Link status: • **ADM**—The interface has been administratively shut down. To recover its physical state, perform the **undo shutdown** command. • **Stby**—The interface is operating as a backup interface. To see the primary interface, use the **display standby state** command described in *High Availability Command Reference*.
Protocol: (s) - spoofing	If the network layer protocol state of an interface is displayed as UP, but its link is an on-demand link or not present at all, its protocol attribute includes the spoofing flag (an **s** in parentheses).
Interface	Abbreviated interface name.

Field	Description
Link	Physical link state of the interface: • **UP**—The link is up. • **ADM**—The link has been administratively shut down. To recover its physical state, perform the **undo shutdown** command.
Protocol	Protocol connection state of the interface: UP or DOWN.
Main IP	Main IP address of the interface.
Description	Description of the interface.
Cause	Cause of a DOWN physical link. If the port has been shut down with the **shutdown** command, this field displays **Administratively**. To restore the physical state of the interface, use the **undo shutdown** command. **Not connected** means no physical connection (no cable is available or the cable is faulty).

Related commands

reset counters interface

display interface serial

Use **display interface serial** to display information about serial interfaces.

Syntax

display interface [**serial**] [**brief** [**down** | **description**]]

display interface [**serial** [*interface-number*]] [**brief** [**description**]]

Views

Any view

Predefined user roles

network-admin

network-operator

Parameters

interface-number: Specifies a serial interface by its number.

brief: Displays brief interface information. If you do not specify this keyword, the command displays detailed interface information.

down: Displays information about interfaces in physically DOWN state and the causes. If you do not specify this keyword, this command displays information about interfaces in all states.

description: Displays complete interface descriptions. If you do not specify this keyword, the command displays only the first 27 characters of interface descriptions.

Usage guidelines

If you do not specify the **serial** keyword, this command displays information about all interfaces on the device.

If you specify the **serial** keyword without the *interface-number* argument, this command displays information about all existing serial interfaces.

Examples

Display detailed information about serial interface Serial 2/0.

```
<Sysname> display interface serial 2/0
Serial2/0
Current state: UP
Line protocol state: UP
Description: Serial2/0 Interface
Bandwidth: 64kbps
Maximum Transmit Unit: 1500
Hold timer: 10 seconds
Internet Address: 9.9.9.6/24 Primary
Link layer protocol: PPP
LCP: opened
Last clearing of counters: Never
Physical layer: synchronous, Baudrate: 64000 bps
Output queue: (Urgent queuing: Size/Length/Discards) 0/100/0
Output queue: (Protocol queuing: Size/Length/Discards) 0/500/0
Output queue: (FIFO queuing: Size/Length/Discards) 0/75/0
Interface: DCE
Cable type: V35
Clock mode: DCECLK
Last 300 seconds input rate: 2.40 bytes/sec, 19 bits/sec, 0.20 packets/sec
Last 300 seconds output rate: 2.40 bytes/sec, 19 bits/sec, 0.20 packets/sec
Input:
  6668 packets, 80414 bytes
  0 broadcasts, 0 multicasts
  0 errors, 0 runts, 0 giants
  0 crc, 0 align errors, 0 overruns
  0 aborts, 0 no buffers
  0 frame errors
Output:
  6670 packets, 80446 bytes
  0 errors, 0 underruns, 0 collisions
  0 deferred
DCD: UP, DTR: UP, DSR: UP, RTS: UP, CTS: UP
```

Display brief information about serial interface Serial 2/0.

```
<Sysname> display interface serial 2/0 brief
Brief information on interface(s) under route mode:
Link: ADM - administratively down; Stby - standby
Protocol: (s) - spoofing
Interface            Link Protocol Main IP         Description
S2/0                 UP   UP(s)    --
```

Display brief information about all serial interfaces in physically DOWN state and the causes.

```
<Sysname> display interface serial brief down
Brief information on interface(s) under route mode:
```

```
Link: ADM - administratively down; Stby - standby
Interface            Link Cause
S2/0                 ADM  Administratively
```

Table 11 Command output

Field	Description
Serial2/0 Current state	Current physical and administrative states of the serial interface, which can be one of the following: • **DOWN (Administratively)**—The serial interface was shut down with the **shutdown** command. • **DOWN**—The serial interface is physically down because no physical link is present or the physical link has failed. • **UP**—The serial interface is both administratively and physically up.
Line protocol current state	Link protocol state of the serial interface.
Description	Description of the serial interface.
Bandwidth	Intended bandwidth of the interface.
Maximum Transmit Unit	MTU on the serial interface.
Hold timer	Interval at which the interface sends keepalive packets.
Internet Address	IP address of the serial interface.
Link layer protocol	Link layer protocol of the serial interface.
LCP: opened	A PPP connection is established successfully.
Last clearing of counters: Never	Time when the **reset counters interface** command was last executed. If the device has never executed the **reset counters interface** command, the field displays **Never**.
Physical layer	Physical layer state.
Baudrate	Baudrate of the interface.
Output queue : (Urgent queuing : Size/Length/Discards) 0/100/0	**Urgent queuing** specifies the current number of packets in the queue, maximum number of packets that can stay in the queue, and number of dropped packets. Link layer protocol packets, such as PPP negotiation packets and keepalive packets enter this queue.
Output queue : (Protocol queuing : Size/Length/Discards) 0/500/0	**Protocol queuing** specifies the current number of packets in the queue, maximum number of packets that can stay in the queue, and number of dropped packets. Packets with IP precedence 6 enter this queue.
Output queue : (FIFO queuing : Size/Length/Discards) 0/75/0	**FIFO queuing** specifies the current number of packets in the first-in first-out (FIFO) queue, maximum number of packets that can stay in the queue, and number of dropped packets.
Interface: DCE Cable type: V35 Clock mode: DCECLK	Synchronizes the clock mode on the DCE side of the serial interface.
Last 300 seconds input rate 2.40 bytes/sec, 19 bits/sec, 0.20 packets/sec	Average input rate in the last 300 seconds.

Field	Description
Last 300 seconds output rate 2.40 bytes/sec, 19 bits/sec, 0.20 packets/sec	Average output rate in the last 300 seconds.
Input: 6668 packets, 80414 bytes 0 broadcasts, 0 multicasts 0 errors, 0 runts, 0 giants 0 crc, 0 align errors, 0 overruns 0 aborts, 0 no buffers 0 frame errors	Received statistics on the serial interface: • **broadcasts**—Number of received broadcast packets. • **multicasts**—Number of received multicast packets. • **errors**—Number of error packets detected on the physical layer. • **runts**—Number of undersized packets received on the serial interface. • **giants**—Number of oversized packets received on the serial interface. • **crc**—Number of normal-sized packets with CRC errors. • **align errors**—Number of align error packets. • **overruns**—Number of packets that the serial interface is unable to process because the serial interface is overrun. • **aborts**—Number of packets that are not received successfully. • **no buffers**—Number of packets that are discarded because the buffer runs out. • **frame errors**—Number of packets with frame errors.
Output: 6670 packets, 80446 bytes 0 errors, 0 underruns, 0 collisions 0 deferred	Sent statistics on the serial interface: • **errors**—Number of error packets detected on the physical layer. • **underruns**—Number of packets that fail to be forwarded because the serial interface reads from memory slower than it forwards packets. • **collisions**—Number of packets with collisions detected. • **deferred**—Number of deferred or timeout packets.
DCD: DOWN, DTR: UP, DSR: DOWN, RTS: UP, CTS: DOWN	Status of Data Carrier Detect (DCD), Data Terminal Ready (DTR), Data Set Ready (DSR), Request to Send (RTS), and Clear to Send (CTS) signals. For more information about DSR, DTR, and DCD, see the detect dcd command.
Brief information on interface(s) under route mode:	Brief information about Layer 3 interfaces.
Link: ADM - administratively down; Stby - standby	Link status: • **ADM**—The interface has been administratively shut down. To recover its physical state, perform the **undo shutdown** command. • **Stby**—The interface is operating as a backup interface. To see the primary interface, use the **display standby state** command in *High Availability Command Reference*.
Protocol: (s) - spoofing	If the network layer protocol state of an interface is displayed as UP, but its link is an on-demand link or not present at all, its protocol attribute includes the spoofing flag (an **s** in parentheses).
Interface	Abbreviated interface name.

Field	Description
Link	Physical link state of the interface: • **UP**—The link is up. • **ADM**—The link has been administratively shut down. To recover its physical state, perform the **undo shutdown** command.
Protocol	Protocol connection state of the interface: UP or DOWN.
Main IP	Main IP address of the interface.
Description	Description of the interface.
Cause	Cause of a DOWN physical link. If the port has been shut down with the **shutdown** command, this field displays **Administratively**. To restore the physical state of the interface, use the **undo shutdown** command. **Not connected** means no physical connection (no cable is available or the cable is faulty).

Related commands

reset counters interface

eliminate-pulse

Use **eliminate-pulse** to eliminate the pulses with a width less than 3.472 μs to increase signal reliability.

Use **undo eliminate-pulse** to restore the default.

Syntax

eliminate-pulse

undo eliminate-pulse

Default

The pulses with a width less than 1.472 μs are eliminated.

Views

Asynchronous serial interface view

Predefined user roles

network-admin

Usage guidelines

You can configure this command for a synchronous/asynchronous interface only after you switch the interface to asynchronous mode with the **physical-mode async** command.

When the baud rate of the interface is 115200 bps, you cannot configure this command. After you configure this command, the baud rate of the interface cannot be set to 115200 bps.

This command applies to 8ASE and 16ASE interface cards.

This command is applicable when the line is seriously interfered.

Examples

Eliminate the pulses with a width less than 3.472 μs on interface Async 6/4/0.

```
<Sysname> system-view
[Sysname] interface async 6/4/0
[Sysname-Async6/4/0] eliminate-pulse
```

Related commands

physical-mode

idle-code

Use **idle-code** to set the line idle code of the synchronous serial interface to 0xFF.

Use **undo idle-code** to restore the default.

Syntax

idle-code { **7e** | **ff** }

undo idle-code

Default

The line idle code of a synchronous serial interface is 0x7E.

Views

Synchronous serial interface view

Predefined user roles

network-admin

Parameters

7e: Specifies the 0x7E line idle code.

ff: Specifies the 0xFF line idle code.

Usage guidelines

In most cases, a synchronous serial interface uses 0x7E to identify the idle state of the line. You might need to set the line idle code to 0xFF to interoperate with devices that use 0xFF (high level of all ones) as line idle code.

Examples

Set the line idle code of synchronous serial interface Serial 2/0 to 0xFF.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] idle-code ff
```

interface async

Use **interface async** to enter asynchronous interface view.

Syntax

interface async *interface-number*

Views

System view

Predefined user roles

network-admin

Parameters

interface-number: Specifies a serial interface by its number.

Examples

Enter view of asynchronous serial interface Async 6/4/0.

```
<Sysname> system-view
[Sysname] interface async 6/4/0
[Sysname-Async6/4/0]
```

interface serial

Use **interface serial** to enter serial interface view or serial sub interface view. Before you enter serial sub interface view, if the specified sub interface does not exist, the command creates the sub interface and enters its view.

Syntax

interface serial *interface-number*

Default

No serial sub interface exists.

Views

System view

Predefined user roles

network-admin

Parameters

interface-number: Specifies a serial interface by its number.

Examples

Create serial interface Serial 2/0.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0]
```

Related commands

link-protocol

invert receive-clock

Use **invert receive-clock** to invert the receive-clock signal on the DTE-side synchronous serial interface.

Use **undo invert receive-clock** to restore the default.

Syntax

invert receive-clock

undo invert receive-clock

Default

Receive-clock signal inversion is disabled on DTE-side synchronous serial interfaces.

Views

Synchronous serial interface view

Predefined user roles

network-admin

Usage guidelines

You might need to invert the receive-clock signal on a DTE-side serial interface to eliminate the half clock-period delay on the line. This command is necessary only for some special DCE devices. In common applications, do not invert the clock.

Examples

Invert the receive-clock on DTE-side synchronous serial interface Serial 2/0.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] invert receive-clock
```

Related commands

- **clock**
- **invert transmit-clock**
- **physical-mode**

invert transmit-clock

Use **invert transmit-clock** to invert the transmit-clock signal on the DTE-side synchronous serial interface.

Use **undo invert transmit-clock** to restore the default.

Syntax

invert transmit-clock

undo invert transmit-clock

Default

Transmit-clock signal inversion is disabled on DTE-side synchronous serial interfaces.

Views

Serial interface view

Predefined user roles

network-admin

Usage guidelines

You might need to invert the receive-clock signal on a DTE-side serial interface to eliminate the half clock-period delay on the line. This command is necessary only for some special DCE devices. In common applications, do not invert the clock.

Examples

Invert the transmit-clock on DTE-side synchronous serial interface Serial 2/0.

```
<Sysname> system-view
```

```
[Sysname] interface serial 2/0
[Sysname-Serial2/0] invert transmit-clock
```

Related commands

- **clock**
- **invert receive-clock**
- **physical-mode**

itf

Use **itf** to set the number of interframe filling tags.

Use **undo itf** to restore the default.

Syntax

itf number *number*

undo itf number

Default

The number of interframe filling tags is 4.

Views

Synchronous serial interface view

Predefined user roles

network-admin

Parameters

number *number*: Sets the number of interframe filling tags (an interframe filling tag is one byte in length), in the range of 0 to 14 bytes.

Examples

Set the number of interframe filling tags to **5**.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] itf number 5
```

link-protocol

Use **link-protocol** to configure the link layer protocol for an interface.

Syntax

link-protocol { **hdlc** | **ppp** }

Default

A synchronous serial interface uses PPP as the link layer protocol.

Views

Asynchronous serial interface view, synchronous/asynchronous serial interface view

Predefined user roles

network-admin

Parameters

hdlc: Specifies the HDLC link layer protocol.

ppp: Specifies the PPP link layer protocol.

Examples

Configure the link layer protocol of Serial 2/0 as **hdlc**.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] link-protocol hdlc
```

loopback

Use **loopback** to enable loopback on the serial interface.

Use **undo loopback** to restore the default.

Syntax

loopback

undo loopback

Default

Loopback is disabled.

Views

Asynchronous interface view, synchronous/asynchronous interface view

Predefined user roles

network-admin

Usage guidelines

Loopback is intended for test use. Disable loopback in other cases.

Examples

Enable loopback on interface Serial 2/0.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] loopback
```

Enable loopback on interface Async 6/4/0.

```
<Sysname> system-view
[Sysname] interface async 6/4/0
[Sysname-Async6/4/0] loopback
```

mtu

Use **mtu** to set the MTU for an interface.

Use **undo mtu** to restore the default.

Syntax

mtu *size*

undo mtu

Default

The MTU of an interface is 1500 bytes.

Views

Asynchronous interface view, serial sub interface view, synchronous/asynchronous interface view

Predefined user roles

network-admin

Parameters

size: Maximum transmission unit (MTU) in the range of 128 to 1650 bytes.

Usage guidelines

The MTU setting can affect IP packets assembly and fragmentation on the interface.

When you use the **mtu** command on a WAN interface, execute the **shutdown** command, and then the **undo shutdown** command to make your configuration take effect.

Examples

Set the MTU of interface Serial 2/0 to 1430 bytes.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] mtu 1430
```

Set the MTU of interface Async 6/4/0 to 1430 bytes.

```
<Sysname> system-view
[Sysname] interface async 6/4/0
[Sysname-Async6/4/0] mtu 1430
```

phy-mru

Use **phy-mru** to set the MRU for an asynchronous serial interface operating in flow mode.

Use **undo phy-mru** to restore the default.

Syntax

phy-mru *mrusize*

undo phy-mru

Default

The MRU of an asynchronous serial interface is 1700 bytes.

Views

Asynchronous serial interface view, synchronous/asynchronous interface view

Predefined user roles

network-admin

Parameters

mrusize: Maximum receive unit (MRU) to be set, in the range of 4 to 1700 bytes.

Usage guidelines

This command applies to only interfaces operating in asynchronous flow mode.

Examples

Set the MRU of interface Async 6/4/0 operating in flow mode to 1500 bytes.

```
<Sysname> system-view
[Sysname] interface async 6/4/0
[Sysname-Async6/4/0] async-mode flow
[Sysname-Async6/4/0] phy-mru 1500
```

Set the MRU of interface serial 2/0 operating in flow mode to 1500 bytes.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] physical-mode async
[Sysname-Serial2/0] async-mode flow
[Sysname-Serial2/0] phy-mru 1500
```

Related commands

- **async-mode**
- **physical-mode**

physical-mode

Use **physical-mode** to set the operating mode of the synchronous/asynchronous serial interface.

Use **undo physical-mode** to restore the default.

Syntax

physical-mode { **async** | **sync** }

undo physical-mode

Default

Synchronous/asynchronous serial interfaces operate in synchronous mode.

Views

Synchronous/asynchronous serial interface view

Predefined user roles

network-admin

Parameters

async: Sets the synchronous/asynchronous serial interface to operate in asynchronous mode.

sync: Sets the synchronous/asynchronous serial interface to operate in synchronous mode.

Examples

Set synchronous/asynchronous serial interface Serial 2/0 to operate in asynchronous mode.

```
<Sysname> system-view
[Sysname] interface serial 2/0
```

```
[Sysname-Serial2/0] physical-mode async
```

reset counters interface

Use **reset counters interface** to clear the statistics for a serial interface.

Syntax

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

Views

User view

Predefined user roles

network-admin

Parameters

serial *interface-number*: Specifies a serial interface by its number.

Usage guidelines

When you collect traffic statistics for a specific period of time on a serial interface, clear the existing statistics on the interface.

- If you do not specify the **serial** keyword, this command clears statistics on all interfaces.
- If you specify the **serial** keyword without the *interface-number* argument, this command clears statistics on all serial interfaces.
- If you specify both the **serial** keyword and the *interface-number* argument, this command clears statistics on a specified serial interface.

Examples

Clear statistics on interface Serial 2/0.

```
<Sysname> reset counters interface serial 2/0
```

Related commands

display interface serial

reset counters interface

Use **reset counters interface** to clear statistics on the specified asynchronous interface.

Syntax

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

Views

User view

Predefined user roles

network-admin

Parameters

async *interface-number*: Specifies an asynchronous interface by its number.

Usage guidelines

When you collect traffic statistics for a specific period of time on an interface, clear the existing statistics on the interface first.

- If you do not specify the **async** keyword, this command clears statistics on all interfaces.
- If you specify the **async** keyword without the *interface-number* argument, this command clears statistics on all asynchronous interfaces.
- If you specify both the **async** keyword and the *interface-number* argument, this command clears statistics on a specified asynchronous interface.

Examples

Clear statistics on interface Async 6/4/0.

```
<Sysname> reset counters interface async 6/4/0
```

Related commands

display interface async

reverse-rts

Use **reverse-rts** to reverse RTS signal in synchronous mode for debugging purpose.

Use **undo reverse-rts** to restore the default.

Syntax

reverse-rts

undo reverse-rts

Default

RTS signal reverse is disabled.

Views

Synchronous serial interface view

Predefined user roles

network-admin

Usage guidelines

This command is used in hardware flow control where the remote is not allowed to send data when the local end is doing that.

Examples

Reverse the RTS signal.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] reverse-rts
```

virtualbaudrate

Use **virtualbaudrate** to set a virtual baud rate for the DTE-side interface.

Use **undo virtualbaudrate** to remove the specified virtual baud rate.

Syntax

virtualbaudrate *virtualbaudrate*

undo virtualbaudrate

Default

The virtual baud rate for a synchronous serial interface is 64000 bps.

Views

Synchronous serial interface view

Predefined user roles

network-admin

Parameters

virtualbaudrate: Baud rate (in bps) to be set, which must be consistent with the one configured at DCE side. It can be 1200, 2400, 4800, 9600, 19200, 38400, 56000, 57600, 64000, 72000, 115200, 128000, 192000, 256000, 384000, 512000, 768000, 1024000, 2048000, or 4096000.

Usage guidelines

When operating as a DTE, the serial interface determines its baud rate through negotiation with the DCE side. The **virtualbaudrate** command allows you to configure DTE-side baudrate manually, but the configured value must be the same as the one set at DCE side.

If the clock selection mode of the serial interface is **dteclk5**, the virtual baud rate you configure is the line rate.

Configure the **baudrate** command at DCE side and the **virtualbaudrate** command at DTE side (only when the interface is operating in synchronous mode). Avoid configuring the two commands at the same end of a link.

At DCE side, the **display interface** command displays the baud rate of the interface. At DTE side, the command displays the virtual baud rate of the interface.

Examples

Set the virtual baudrate of DTE interface Serial 2/0 to 19200 bps.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] virtualbaudrate 19200
```

Related commands

- **baudrate**
- **clock**

AM interface configuration commands

async-mode

Use **async-mode** to set the operating mode of the current interface.

Use **undo async-mode** to restore the default.

Syntax

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

undo async-mode

Default

An AM interface operates in flow mode.

Views

AM interface view

Predefined user roles

network-admin

Parameters

flow: Configures the interface to operate in flow mode, or named interactive mode. In this mode, the two ends interact attempting to set up a link after the physical link is set up. During this process, the calling party sends configuration commands to the called party (this is equal to the operation of manually inputting configuration commands at the remote end), sets the link layer protocol operating parameters of the called party, and then sets up the link. This approach applies to man-machine interactions such as dial-in access.

protocol: Configures the interface to operate in protocol mode. In protocol mode, the interface uses configured link layer protocol parameters to set up a link with the remote end after its physical link is established.

Examples

Configure AM interface Analogmodem 6/3/0 to operate in flow mode.

```
<Sysname> system-view
[Sysname] interface analogmodem 6/3/0
[Sysname-Analogmodem6/3/0] async-mode protocol
```

display interface analogmodem

Use **display interface analogmodem** to display information about an AM interface.

Syntax

display interface [**analogmodem**] [**brief** [**down** | **description**]]

display interface [**analogmodem** [*interface-number*]] [**brief** [**description**]]

Views

Any view

Predefined user roles

network-admin

network-operator

Parameters

interface-number: Specifies an AM interface by its number.

brief: Displays brief interface information. If you do not specify this keyword, the command displays detailed interface information.

down: Displays information about interfaces in physically DOWN state and the causes. If you do not specify this keyword, the command displays information about interfaces in all states.

description: Displays complete interface descriptions. If you do not specify this keyword, the command displays only the first 27 characters of interface descriptions.

Usage guidelines

If you do not specify the **analogmodem** keyword, this command displays information about all interfaces on the device.

If you specify the **analogmodem** keyword without the *interface-number* argument, this command displays information about all existing AM interfaces.

Examples

Display detailed information about interface Analogmodem 6/3/0.

```
<Sysname> display interface analogmodem 6/3/0
Analogmodem6/3/0
Current state: DOWN
Line protocol state: DOWN
Description: Analogmodem6/3/0 Interface
Bandwidth: 57kbps
Maximum Transmit Unit: 1500
Hold timer: 10 seconds
Internet protocol processing: disabled
Link layer protocol: PPP
LCP: initial
Last clearing of counters: Never
Physical layer: asynchronous, Baudrate: 57600 bps
Phy-mru: 1700
Last 300 seconds input rate: 0.00 bytes/sec, 0 bits/sec, 0.00 packets/sec
Last 300 seconds output rate: 0.00 bytes/sec, 0 bits/sec, 0.00 packets/sec
Input:
  0 packets, 0 bytes
  0 broadcasts, 0 multicasts
  0 errors, 0 runts, 0 giants
  0 crc, 0 align errors, 0 overruns
  0 aborts, 0 no buffers
  0 frame errors
Output:
  0 packets, 0 bytes
  0 errors, 0 underruns, 0 collisions
  0 deferred
DCD: DOWN, DTR: UP, DSR: UP, RTS: UP, CTS: UP
```

Display brief information about interface Analogmodem 6/3/0.

```
<Sysname> display interface analogmodem 6/3/0 brief
Brief information on interface(s) under route mode:
Link: ADM - administratively down; Stby - standby
Protocol: (s) - spoofing
Interface            Link Protocol Main IP         Description
Ana6/3/0             DOWN DOWN     --
```

Display brief information about all AM interfaces in physically DOWN state and the causes.

```
<Sysname> display interface analogmodem brief down
Brief information on interface(s) under route mode:
Link: ADM - administratively down; Stby - standby
Interface            Link Cause
Ana6/3/0             ADM  Administratively
```

Table 12 Command output

Field	Description
Analogmodem6/3/0 Current state	Physical state of the AM interface: • **DOWN (Administratively)**—The AM interface has been shut down with the **shutdown** command. • **DOWN**—The AM interface is physically shut down because no physical link is present or the physical link has failed. • **UP**—The AM interface is both administratively and physically up.
Line protocol state	Link protocol state of the interface.
Description	Description of the interface.
Bandwidth	Intended bandwidth of the interface.
Maximum Transmit Unit	MTU of the interface.
Hold timer	Interval at which the interface sends keepalive packets.
Internet protocol processing	Network layer protocol processing state.
Link layer protocol PPP	Link layer protocol of the interface.
LCP initial	LCP has been successfully initialized.
Last clearing of counters	Time when the **reset counters interface** command was last executed. If the device has never executed the **reset counters interface** command, the field displays **Never**.
Physical layer	Physical layer state.
Baudrate	Baudrate of the interface.
Last 300 seconds input rate: 0.00 bytes/sec, 0 bits/sec, 0.00 packets/sec	Average input rate in the last 300 seconds.
Last 300 seconds output rate: 0.00 bytes/sec, 0 bits/sec, 0.00 packets/sec	Average output rate in the last 300 seconds.

Field	Description
Input: 0 packets, 0 bytes 0 broadcasts, 0 multicasts 0 errors, 0 runts, 0 giants 0 crc, 0 align errors, 0 overruns 0 aborts, 0 no buffers 0 frame errors	Received statistics on the AM interface: • **broadcasts**—Number of received broadcast packets. • **multicasts**—Number of received multicast packets. • **errors**—Number of error packets detected on the physical layer. • **runts**—Number of undersized packets received on the interface. • **giants**—Number of oversized packets received on the interface. • **crc**—Number of normal-sized packets with CRC errors received on the interface. • **align errors**—Number of packets with alignment errors received on the interface. • **overruns**—Number of packets dropped because the input rate of the interface exceeded the queuing capability. • **aborts**—Number of packets that are not received successfully. • **no buffers**—Number of packets that are discarded because the buffer runs out. • **frame errors**—Number of packets with frame errors.
Output: 0 packets, 0 bytes 0 errors, 0 underruns, 0 collisions 0 deferred	Sent statistics on the AM interface: • **errors**—Number of error packets detected at the physical layer. • **underruns**—Number of packets that fail to be forwarded because the interface reads from memory at a slower speed than it forwards packets. • **collisions**—Number of packets with collisions detected. • **deferred**—Number of deferred or timeout packets.
DCD: DOWN, DTR: UP, DSR: DOWN, RTS: UP, CTS: DOWN	Status of Data Carrier Detect (DCD), Data Terminal Ready (DTR), Data Set Ready (DSR), Request to Send (RTS), and Clear to Send (CTS) signals.
Brief information on interface(s) under route mode	Brief information about Layer 3 interfaces.
Link: ADM - administratively down; Stby - standby	Link status: • **ADM**—The interface has been administratively shut down. To recover its physical state, perform the **undo shutdown** command. • **Stby**—The interface is operating as a backup interface. To see the primary interface, use the **display standby state** command described in *High Availability Command Reference*.
Protocol: (s) - spoofing	If the network layer protocol state of an interface is displayed as UP, but its link is an on-demand link or not present at all, its protocol attribute includes the spoofing flag (an **s** in parentheses).
Interface	Abbreviated interface name.
Link	Physical link state of the interface: • **UP**—The link is up. • **ADM**—The link has been administratively shut down. To recover its physical state, perform the **undo shutdown** command.

Field	Description
Protocol	Protocol connection state of the interface: UP or DOWN.
Main IP	Main IP address of the interface.
Description	Description of the interface.
Cause	Cause of a DOWN physical link. If the port has been shut down with the **shutdown** command, this field displays **Administratively**. To restore the physical state of the interface, use the **undo shutdown** command. **Not connected** means no physical connection (no cable is available or the cable is faulty).

Related commands

reset counters interface

interface analogmodem

Use **interface analogmodem** to enter AM interface view.

Syntax

interface analogmodem *interface-number*

Views

System view

Predefined user roles

network-admin

Parameters

interface-number: Specifies an AM interface by its number.

Examples

Enter view of AM interface Analogmodem 6/3/0.

```
<Sysname> system-view
[Sysname] interface analogmodem 6/3/0
[Sysname-Analogmodem6/3/0]
```

loopback

Use **loopback** to enable loopback on the serial interface.

Use **undo loopback** to restore the default.

Syntax

loopback

undo loopback

Default

Loopback is disabled.

Views

AM interface view

Predefined user roles

network-admin

Usage guidelines

Loopback is intended for test use. Disable loopback in other cases.

Examples

Enable loopback on interface Analogmodem 6/3/0.

```
<Sysname> system-view
[Sysname] interface analogmodem 6/3/0
[Sysname-Analogmodem6/3/0] loopback
```

mtu

Use **mtu** to set the MTU for an AM interface.

Use **undo mtu** to restore the default.

Syntax

mtu *size*

undo mtu

Default

The MTU of an AM interface is 1500 bytes.

Views

AM interface view

Predefined user roles

network-admin

Parameters

size: MTU in the range of 128 to 1650 bytes.

Usage guidelines

The MTU setting can affect IP packets assembly and fragmentation on the interface.

Examples

Set the MTU of interface Analogmodem 6/3/0 to 1430 bytes.

```
<Sysname> system-view
[Sysname] interface analogmodem 6/3/0
[Sysname-Analogmodem6/3/0] mtu 1430
```

phy-mru

Use **phy-mru** to set the MRU for an AM interface operating in flow mode.

Use **undo phy-mru** to restore the default.

Syntax

phy-mru *mrusize*

undo phy-mru

Default

The MRU of an AM interface is 1700 bytes.

Views

AM interface view

Predefined user roles

network-admin

Parameters

mrusize: Maximum receive unit (MRU) to be set, in the range of 4 to 1700 bytes.

Usage guidelines

This command applies to only interfaces operating in asynchronous flow mode.

Examples

Set the MRU of interface Analogmodem 6/3/0 operating in flow mode to 1500 bytes.

```
<Sysname> system-view
[Sysname] interface analogmodem 6/3/0
[Sysname-Analogmodem6/3/0] async-mode flow
[Sysname-Analogmodem6/3/0] phy-mru 1500
```

Related commands

async-mode

reset counters interface

Use **reset counters interface** to clear the statistics for an AM interface.

Syntax

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

Views

User view

Predefined user roles

network-admin

Parameters

analogmodem *interface-number*: Specifies an AM interface by its number.

Usage guidelines

When you collect traffic statistics for a specific period of time on an AM interface, clear the existing statistics on the interface.

- If you do not specify the **analogmodem** keyword, this command clears statistics on all interfaces.
- If you specify the **analogmodem** keyword without the *interface-number* argument, this command clears statistics on all AM interfaces.

- If you specify both the **analogmodem** keyword and the *interface-number* argument, this command clears statistics on a specified AM interface.

Examples

Clear statistics on interface Analogmodem 6/3/0.

```
<Sysname> reset counters interface analogmodem 6/3/0
```

Related commands

display interface analogmodem

ISDN BRI interface configuration commands

activate

Use **activate** to activate a BRI interface.

Syntax

activate

Default

A BRI interface is not activated.

Views

ISDN BRI interface view

Predefined user roles

network-admin

Usage guidelines

If no calling exists on a BRI interface, the BRI interface is not activated. This command enables you to activate such an interface.

Examples

Activate interface BRI 1/0.

```
<Sysname> system-view
[Sysname] interface bri 1/0
[Sysname-Bri1/0] activate
```

display interface bri

Use **display interface bri** to display information about BRI interfaces.

Syntax

display interface [**bri**] [**brief** [**down** | **description**]]

display interface [**bri** [*interface-number*]] [**brief** [**description**]]

Views

Any view

Predefined user roles

network-admin

network-operator

Parameters

interface-number: Specifies a BRI interface by its number.

brief: Displays brief interface information. If you do not specify this keyword, the command displays detailed interface information.

down: Displays information about interfaces in physically DOWN state and the causes. If you do not specify this keyword, this command displays information about interfaces in all states.

description: Displays complete interface descriptions. If you do not specify this keyword, the command displays only the first 27 characters of interface descriptions.

Usage guidelines

If you do not specify the **bri** keyword, this command displays information about all interfaces on the device.

If you specify the **bri** keyword without the *interface-number* argument, this command displays information about all existing BRI interfaces.

Examples

Display detailed information about interface BRI 1/0.

```
<Sysname> display interface bri 1/0
Bri1/0
Current state: DOWN ( Administratively )
Line protocol state: UP (spoofing)
Description: Bri1/0 Interface
Bandwidth: 128kbps
Maximum Transmit Unit: 1500
Hold timer: 10 seconds
Baudrate: 128000 bps
Timeslot(s) Used: 1, 2
Internet protocol processing: disabled
Link layer protocol: PPP
LCP: initial
Output queue - Urgent queuing: Size/Length/Discards 0/100/0
Output queue - Protocol queuing: Size/Length/Discards 0/500/0
Output queue - FIFO queuing: Size/Length/Discards 0/75/0
Last 5 seconds input rate: 0.00 bytes/sec, 0 bits/sec, 0.00 packets/sec
Last 5 seconds output rate: 0.00 bytes/sec, 0 bits/sec, 0.00 packets/sec
Input:
  0 packets, 0 bytes
  0 errors, 0 runts, 0 giants,
  0 crc, 0 align errors, 0 overruns,
  0 aborts, 0 no buffers
  0 frame errors
Output:
  0 packets, 0 bytes
  0 errors, 0 underruns, 0 collisions
```

```
  0 deferred
```

Display brief information about interface BRI 1/0.

```
<Sysname> display interface bri 1/0 brief
Brief information on interface(s) under route mode:
Link: ADM - administratively down; Stby - standby
Protocol: (s) - spoofing
Interface            Link Protocol Main IP         Description
Bri1/0               ADM  UP(s)    --
```

Display brief information about all BRI interfaces in physically DOWN state and the causes.

```
<Sysname> display interface bri brief down
Brief information on interface(s) under route mode:
Link: ADM - administratively down; Stby - standby
Interface              Link Cause
Bri1/0                 ADM  Administratively
```

Table 13 Command output

Field	Description
Bri1/0 Current state	Physical state of the interface: • **DOWN (Administratively)**—The BRI interface has been shut down with the **shutdown** command. • **DOWN**—The BRI interface is physically shut down because no physical link is present or the physical link has failed. • **UP**—The BRI interface is both administratively and physically up.
Line protocol state	Link protocol state of the interface.
Description	Description of the interface.
Bandwidth	Intended bandwidth of the interface.
Maximum Transmit Unit	MTU of the BRI interface.
Baudrate	Baudrate of the BRI interface.
Timeslot(s) Used	Time slot used by the BRI interface.
Internet protocol processing	Network layer protocol processing state.
Link layer protocol PPP	Link layer protocol of the interface.
LCP initial	LCP has been successfully initialized.
Output queue - Urgent queuing	Packets statistics of urgent output queue.
Output queue - Protocol queuing	Packets statistics of protocol output queue.
Output queue - FIFO queuing	Packets statistics of FIFO output queue.
Last 5 seconds input rate 0.00 bytes/sec, 0 bits/sec, 0.00 packets/sec	Average input rate in the last 5 seconds.
Last 5 seconds output rate 0.00 bytes/sec, 0 bits/sec, 0.00 packets/sec	Average output rate in the last 5 seconds.

Field	Description
Input: 0 packets, 0 bytes 0 errors, 0 runts, 0 giants, 0 crc, 0 align errors, 0 overruns, 0 aborts, 0 no buffers 0 frame errors	Received statistics on the BRI interface: • **errors**—Number of error packets detected on the physical layer. • **runts**—Number of undersized packets received on the interface. • **giants**—Number of oversized packets received on the interface. • **crc**—Number of normal-sized packets with CRC errors received on the interface. • **align errors**—Number of packets with alignment errors received on the interface. • **overruns**—Number of packets dropped because the input rate of the interface exceeded the queuing capability. • **aborts**—Number of packets that are not received successfully. • **no buffers**—Number of packets that are discarded because the buffer runs out. • **frame errors**—Number of packets with frame errors.
Output: 0 packets, 0 bytes 0 errors, 0 underruns, 0 collisions 0 deferred	Sent statistics on the BRI interface: • **errors**—Number of error packets detected at the physical layer. • **underruns**—Number of packets that fail to be forwarded because the interface reads from memory at a slower speed than it forwards packets. • **collisions**—Number of packets with collisions detected. • **deferred**—Number of deferred or timeout packets.
Brief information of interface(s) under route mode:	Brief information about Layer 3 interfaces.
Link: ADM - administratively down; Stby - standby	Link status: • **ADM**—The interface has been administratively shut down. To recover its physical state, perform the **undo shutdown** command. • **Stby**—The interface is operating as a backup interface. To see the primary interface, use the **display standby state** command in *High Availability Command Reference*.
Protocol: (s) - spoofing	If the network layer protocol state of an interface is shown as UP, but its link is an on-demand link or not present at all, its protocol attribute includes the spoofing flag (an **s** in parentheses).
Interface	Abbreviated interface name.
Link	Physical link state of the interface: • **UP**—The link is up. • **ADM**—The link has been administratively shut down. To recover its physical state, perform the **undo shutdown** command.
Protocol	Protocol connection state of the interface: UP or DOWN.
Main IP	Main IP address of the interface.
Description	Description of the interface.

Field	Description
Cause	Cause of a DOWN physical link. If the port has been shut down with the **shutdown** command, this field displays **Administratively**. To restore the physical state of the interface, use the **undo shutdown** command. **Not connected** means no physical connection (no cable is available or the cable is faulty).

Related commands

reset counters interface

interface bri

Use **interface bri** to enter BRI interface view.

Syntax

interface bri *interface-number*

Views

System view

Predefined user roles

network-admin

Parameters

interface-number: Specifies a BRI interface by its number.

Examples

Enter view of interface BRI 1/0.

```
<Sysname> system-view
[Sysname] interface bri 1/0
[Sysname-Bri1/0]
```

loopback

Use **loopback** to set the B1, B2, or both channels on the ISDN BRI interface in external loopback. This allows data from a line to be sent back to the line.

Use **undo loopback** to restore the default.

Syntax

loopback { **b1** | **b2** | **both** }

undo loopback

Default

Loopback is disabled on ISDN BRI interfaces.

Views

ISDN BRI interface view

Predefined user roles

network-admin

Parameters

b1: Places the B1 channel in external loopback.

b2: Places the B2 channel in external loopback.

both: Places both B1 and B2 channels in external loopback.

Usage guidelines

The modules with loopback-supported ISDN interfaces include 4BS (MIM), and 1BS\1BU\2BS\2BU (SIC). In addition, loopback is also supported by the fixed ISDN interfaces on your router, if there is any. ISDN BRI interfaces support B1 external loopback, B2 external loopback, or both.

Examples

Place the B1 and B2 channels on interface BRI 1/0 in external loopback.

```
<Sysname> system-view
[Sysname] interface bri 1/0
[Sysname-Bri1/0] loopback both
```

mtu

Use **mtu** to set the MTU of a BRI interface.

Use **undo mtu** to restore the default.

Syntax

mtu *size*

undo mtu

Default

The MTU of a BRI interface is 1500 bytes.

Views

ISDN BRI interface view

Predefined user roles

network-admin

Parameters

size: MTU of the current interface, in the range of 128 to 1500 bytes.

Usage guidelines

To validate your MTU setting, shut down and then bring up the interface with the **shutdown** and **undo shutdown** commands.

Examples

Set the MTU of the BRI interface BRI 1/0 to 1430 bytes.

```
<Sysname> system-view
[Sysname] interface bri 1/0
[Sysname-Bri1/0] mtu 1430
```

reset counters interface

Use **reset counters interface** to clear statistics on the specified BRI interface.

Syntax

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

Views

User view

Predefined user roles

network-admin

Parameters

bri *interface-number*: Specifies a BRI interface by its number.

Usage guidelines

When you collect traffic statistics for a specific period of time on a BRI interface, clear the existing statistics on the interface.

- If you do not specify the **bri** *interface-number* option, this command clears statistics on all interfaces.
- If you specify the **bri** keyword without the *interface-number* argument, this command clears statistics on all BRI interfaces.
- If you specify both the **bri** keyword and the *interface-number* argument, this command clears statistics on a specified BRI interface.

Examples

Clear statistics on interface BRI 1/0.

```
<Sysname> reset counters interface bri 1/0
```

Related commands

display interface bri

Basic CE1/PRI interface configuration commands

alarm-detect

Use **alarm-detect** to enable RAI detection on the interface.

Use **undo alarm-detect** to disable RAI detection on the interface.

Syntax

alarm-detect rai

undo alarm-detect rai

Default

RAI detection is enabled on an interface.

Views

CE1/PRI interface view

Predefined user roles

network-admin

Parameters

rai: Remote Alarm Indication (RAI).

Usage guidelines

This command is applicable when the interface operates in CE1 mode.

Examples

Enable RAI detection on CE1/PR1 interface E1 2/0.

```
<Sysname> system-view
[Sysname] controller e1 2/0
[Sysname-E1 2/0] alarm-detect rai
```

cable (CE1/PRI interface)

Use **cable** to set the cable type for a CE1/PRI interface.

Use **undo cable** to restore the default.

Syntax

cable { **long** | **short** }

undo cable

Default

The **long** keyword applies.

Views

CE1/PRI interface view

Predefined user roles

network-admin

Parameters

long: Sets the attenuation of receiver to –43 dB.

short: Sets the attenuation of receiver to –10 dB.

Examples

Set the cable length matching CE1/PRI interface E1 2/0 to **short**.

```
<Sysname> system-view
[Sysname] controller e1 2/0
[Sysname-E1 2/0] cable short
```

channel-set (CE1/PRI interface)

Use **channel-set** to bundle timeslots on the CE1/PRI interface into a channel set.

Use **undo channel-set** to cancel the bundling.

Syntax

channel-set *set-number* **timeslot-list** *list*

undo channel-set [*set-number*]

Default

No timeslots are bundled into channel sets.

Views

CE1/PRI interface view

Predefined user roles

network-admin

Parameters

set-number: The number of the channel set formed by bundling timeslots on the interface, in the range of 0 to 30.

timeslot-list *list*: Specifies the timeslots to be bundled. The *list* argument can contain multiple timeslot numbers, each of which is in the range of 1 to 31. You can specify a single timeslot by specifying a timeslot number, a range of timeslots by providing this argument in the form of { *number1-number2* }, or multiple timeslots by providing this argument in the form of { *number1*, *number2-number3* }.

Usage guidelines

A CE1/PRI interface in CE1/PRI mode is physically divided into 32 timeslots numbered 0 through 31.

In actual applications, all the timeslots except timeslot 0 can be bundled into multiple channel sets. For each channel set, the system automatically creates a serial interface that is logically equivalent to a synchronous serial interface.

The serial interface is numbered in the form of **serial** *interface-number*:*set-number*, where, *interface-number* is the number of the CE1/PRI interface, and *set-number* is the number of the channel set.

A CE1/PRI interface supports only one timeslot bundling mode at a time. You cannot configure this command together with the **pri-set** command.

Examples

Bundle timeslots **1**, **2**, **5**, **10** through **15**, and **18** on CE1/PRI interface E1 2/0 into channel set **0**.

```
<Sysname> system-view
[Sysname] controller e1 2/0
[Sysname-E1 2/0] channel-set 0 timeslot-list 1,2,5,10-15,18
```

Related commands

pri-set

clock (CE1/PRI interface)

Use **clock** to configure clock source for the CE1/PRI interface.

Use **undo clock** to restore the default.

Syntax

clock { **master** | **slave** }

undo clock

Default

The clock source is line clock (slave).

Views

CE1/PRI interface view

Predefined user roles

network-admin

Parameters

master: Adopts the internal clock as the clock source.

slave: Adopts the line clock as the clock source.

Usage guidelines

When the CE1/PRI interface is operating as a DCE, select the internal clock (**master**) for it. When it is operating as a DTE, select the line clock for it.

Examples

Use the internal clock as the clock source on CE1/PRI interface E1 2/0.

```
<Sysname> system-view
[Sysname] controller e1 2/0
[Sysname-E1 2/0] clock master
```

clock-change auto

Use **clock-change auto** to enable the automatic clock mode change function on the interface. In other words, configure the interface that uses the slave clock mode to automatically switch to the master clock mode when receiving an alarm indication signal (AIS)/loss of signal (LOS)/loss of frame (LOF) alarm. After the alarm is cleared, the interface automatically switches back to the user-configured clock mode.

Use **undo clock-change auto** to disable the automatic clock mode change function. If the interface has already switched its clock mode, this command restores the user-configured clock mode for the interface.

Syntax

clock-change auto

undo clock-change auto

Default

Automatic clock mode change is disabled.

Views

CE1/PRI interface view

Predefined user roles

network-admin

Examples

Enable automatic clock mode change for interface E1 2/0.

```
<Sysname> system-view
[Sysname] controller e1 2/0
```

```
[Sysname-E1 2/0] clock-change auto
```

Related commands

clock

code (CE1/PRI interface)

Use **code** to set the line code format for a CE1/PRI interface.

Use **undo code** to restore the default.

Syntax

code { **ami** | **hdb3** }

undo code

Default

The line code format for a CE1/PRI interface is HDB3

Views

CE1/PRI interface view

Predefined user roles

network-admin

Parameters

ami: Adopts alternate mark inversion (AMI) line code format.

hdb3: Adopts high density bipolar 3 (HDB3) line code format.

Usage guidelines

Keep the line code format of the interface in consistency with that used by the remote device.

To ensure normal operation of the interface, configure the **data-coding inverted** command on it when its line code format is set to AMI.

Examples

Set the line code format of interface E1 2/0 to **ami**.

```
<Sysname> system-view
[Sysname] controller e1 2/0
[Sysname-E1 2/0] code ami
```

Related commands

data-coding

controller e1

Use **controller e1** to enter CE1/PRI interface view.

Syntax

controller e1 *number*

Views

System view

Predefined user roles

network-admin

Parameters

number: Specifies a CE1/PRI interface by its number.

Examples

Enter E1 2/0 interface view.

```
<Sysname> system-view
[Sysname] controller e1 2/0
[Sysname-E1 2/0]
```

data-coding (CE1/PRI interface)

Use **data-coding** to enable user data inversion on a CE1/PRI interface.

Use **undo data-coding** to restore the default.

Syntax

data-coding { **inverted** | **normal** }

undo data-coding

Default

Data inversion is disabled.

Views

CE1/PRI interface view

Predefined user roles

network-admin

Parameters

inverted: Enables user data inversion.

normal: Disables user data inversion.

Usage guidelines

To prevent 7e in valid data from being taken for stuffing characters, HDLC inserts a zero after every five ones in the data stream, then inverts every one bit into a zero and every zero bit into a one. This ensures that at least one out of every eight bits is a one. When AMI encoding is adopted on an E1 interface, the use of data inversion can eliminate the presence of multiple consecutive zeros.

On the CE1/PRI interfaces at two ends of an E1 line, use the same data inversion setting.

Examples

Enable user data inversion on CE1/PRI interface E1 2/0.

```
<Sysname> system-view
[Sysname] controller e1 2/0
[Sysname-E1 2/0] data-coding inverted
```

detect-ais

Use **detect-ais** to enable alarm indication signal (AIS) test on an interface.

Use **undo detect-ais** to disable AIS test.

Syntax

detect-ais

undo detect-ais

Default

AIS test is performed.

Views

CE1 interface view, PRI interface view

Predefined user roles

network-admin

Usage guidelines

This command is effective when a CE1/PRI interface operates in E1 mode.

Examples

Enable AIS test on E1 2/0 interface.

```
<Sysname> system-view
[Sysname] controller e1 2/0
[Sysname-E1 2/0] detect-ais
```

display controller e1

Use **display controller e1** to display information about CE1/PRI interfaces.

Syntax

display controller e1 [*interface-number*]

Views

Any view

Predefined user roles

network-admin

network-operator

Parameters

interface-number: Specifies a CE1/PRI interface by its number. If you do not specify this argument, this command displays information about all CE1/PRI interfaces.

Examples

Display information about interface E1 2/0.

```
<Sysname> display controller e1 2/0
E1 2/0
Current state: UP
```

```
Description: E1 2/0 Interface
Basic Configuration:
  Work mode: E1 framed, Cable type: 75 Ohm unbalanced
  Frame-format: no-crc4, Line code: hdb3, Source clock: slave
  Idle code: 7e, Itf type: 7e, Itf number: 4, Loop back: not set
Alarm State:
  Receiver alarm state is None
Historical Statistics:
Last clearing of counters: Never
Data in current interval (150 seconds elapsed):
  Loss Frame Alignment: 0 seconds, Framing Error: 0 seconds
  CRC Error: 0 seconds, Alarm Indication: 0 seconds
  Loss-of-signals: 0 seconds, Code Violations: 0 seconds
  Slip: 0 seconds, E-Bit error: 0 seconds
```

Table 14 Command output

Field	Description
E1 2/0 Current state	State of the interface.
Description	Description of the interface.
Work mode	Work mode of the interface: E1 or CE1.
Cable type	Cable type of the interface.
Frame-format	Frame format of the interface: crc4 or no crc4.
Source Clock	Work mode of the source clock of the interface: master or slave.
Line Code	Line code: AMI or HDB3.
Idle Code	Idle code; 7E or FF.
Itf type	Interframe filling tag: 7E or FF.
Itf number	Number of interframe filling tags between two successive frames.
Loopback	Loopback state.
Alarm State	Alarm state.
Historical Statistics	Statistics on the interface.
Last clearing of counters	The last time when statistics on the interface were cleared.
Data in current interval (150 seconds elapsed): Loss Frame Alignment: 0 seconds, Framing Error: 0 seconds CRC Error: 0 seconds, Alarm Indication: 0 seconds Loss-of-signals: 0 seconds, Code Violations: 0 seconds Slip: 0 seconds, E-Bit error: 0 seconds	Error statistics in the current interval.

Related commands

reset counters controller e1

frame-format (CE1/PRI interface)

Use **frame-format** to set the framing format on the CE1 interface.

Use **undo frame-format** to restore the default.

Syntax

frame-format { **crc4** | **no-crc4** }

undo frame-format

Default

The framing format on a CE1 interface is no-CRC4.

Views

CE1/PRI interface view

Predefined user roles

network-admin

Parameters

crc4: Sets the framing format to CRC4.

no-crc4: Sets the framing format to no-CRC4.

Usage guidelines

A CE1/PRI interface in CE1 mode supports both CRC4 and no-CRC4 framing formats, where CRC4 supports four-bit CRC on physical frames but no-CRC4 does not.

Examples

Set the framing format on interface E1 2/0 to CRC4.

```
<Sysname> system-view
[Sysname] controller e1 2/0
[Sysname-E1 2/0] frame-format crc4
```

idle-code (CE1/PRI interface)

Use **idle-code** to set the line idle code on the CE1/PRI interface.

Use **undo idle-code** to restore the default.

Syntax

Idle-code { **7e** | **ff** }

undo idle-code

Default

The line idle code is 0x7E.

Views

CE1/PRI interface view

Predefined user roles

network-admin

Parameters

7e: Sets the line idle code to 0x7E.

ff: Sets the line idle code to 0xFF.

Usage guidelines

The line idle code is sent in timeslots that are not bundled with logical channels.

Examples

Set the line idle code to 0x7E on interface E1 2/0.

```
<Sysname> system-view
[Sysname] controller e1 2/0
[Sysname-E1 2/0] idle-code 7e
```

itf (CE1/PRI interface)

Use **itf** to set the type of and the number of interframe filling tags on the CE1/PRI interface. Two types of interframe filling tag are available: 0x7E and 0xFF.

Use **undo itf** to restore the default.

Syntax

itf { **number** *number* | **type** { **7e** | **ff** } }

undo itf { **number** | **type** }

Default

Interframe filling tag is 0x7E and the number of interframe filling tags is 4.

Views

CE1/PRI interface view

Predefined user roles

network-admin

Parameters

number *number*: Sets the number of interframe filling tags (an interframe filling tag is one byte in length), in the range of 0 to 14.

type { **7e** | **ff** }: Sets the type of interframe filling tag to 0x7E by specifying the **7e** argument or to 0xFF by specifying the **ff** keyword.

Usage guidelines

Interframe filling tags are sent when no service data is sent on the timeslots bundled into logical channels on the CE1/PRI interface.

Examples

Set the type of interframe filling tag to 0xFF on interface E1 2/0.

```
<Sysname> system-view
[Sysname] controller e1 2/0
[Sysname-E1 2/0] itf type ff
```

Set the number of interframe filling tags to **5** on interface E1 2/0.

```
<Sysname> system-view
[Sysname] controller e1 2/0
[Sysname-E1 2/0] itf number 5
```

loopback (CE1/PRI interface)

Use **loopback** to enable loopback and set the loopback mode.

Use **undo loopback** to restore the default.

Syntax

loopback { **local** | **payload** | **remote** }

undo loopback

Default

Loopback is disabled.

Views

CE1/PRI interface view

Predefined user roles

network-admin

Parameters

local: Sets the interface to operate in local loopback mode.

payload: Sets the interface to operate in external payload loopback mode.

remote: Sets the interface to operate in external loopback mode.

Usage guidelines

Loopback is mainly used to check the condition of interfaces or cables. Disable loopback in other cases.

You can bundle timeslots on the CE1/PRI interface to form a serial interface and encapsulate it with PPP. After you enable loopback on this serial interface, it is normal that the state of the link layer protocol is reported as down.

Examples

Set interface E1 2/0 to operate in internal loopback mode.

```
<Sysname> system-view
[Sysname] controller e1 2/0
[Sysname-E1 2/0] loopback local
```

pri-set (CE1/PRI interface)

Use **pri-set** to bundle timeslots on the CE1/PRI interface into a PRI set.

Use **undo pri-set** to remove the bundle.

Syntax

pri-set [**timeslot-list** *list*]

undo pri-set

Default

No PRI set is created.

Views

CE1/PRI interface view

Predefined user roles

network-admin

Parameters

timeslot-list *list*: Specifies the timeslots to be bundled. The *list* argument can contain multiple timeslot numbers, each of which is in the range of 1 to 31. You can specify a single timeslot by specifying a timeslot number, a range of timeslots by providing this argument in the form of { *number1*-*number2* }, or multiple timeslots by providing this argument in the form of { *number1*, *number2*-*number3* }.

Usage guidelines

On a CE1/PRI interface in PRI mode, timeslot 0 is used for frame synchronization control (FSC), timeslot 16 as the D channel for signaling transmission, and other timeslots as B channels for data transmission.

You can create only one PRI set on a CE1/PRI interface. This PRI set can include any timeslots except timeslot 0, and must include timeslot 16. Timeslot 16 cannot form a bundle that includes itself only. The attempt to bundle only timeslot 16 will fail.

If no timeslot is specified in this command, all timeslots except timeslot 0 are bundled into an interface in the form of 30B + D.

Upon creation of the PRI set, the system creates a serial interface that is logically equivalent to an ISDN PRI interface. The serial interface is named in the form of **serial** *number*:**15**, where *number* represents the number of the CE1/PRI interface where the serial interface is created.

Because a channel set and a PRI set cannot coexist on a CE1/PRI interface, your PRI set creation attempt will fail if the **channel-set** command is configured.

Examples

Bundle timeslots 1, 2, and 8 through 12 into a PRI set on CE1/PRI interface E1 2/0.

```
<Sysname> system-view
[Sysname] controller e1 2/0
[Sysname-E1 2/0] pri-set timeslot-list 1,2,8-12
```

Related commands

channel-set

reset counters controller e1

Use **reset counters controller e1** to clear the controller counter for a CE1/PRI interface.

Syntax

reset counters controller e1 [*interface-number*]

Views

User view

Predefined user roles

network-admin

Parameters

interface-number: Specifies a CE1/PRI interface by its number. If you do not specify this argument, the command clears the controller counter for all CE1/PRI interfaces.

Usage guidelines

The **reset counters interface** command clears the counters of all interfaces. To clear the controller counter of individual CE1/PRI interfaces, use the **reset counters controller e1** command.

Examples

Clear the controller counter for CE1/PRI interface E1 2/0.

```
<Sysname> reset counters controller e1 2/0
```

Related commands

display controller e1

using (CE1/PRI interface)

Use **using** to set the operating mode of a CE1/PRI interface.

Use **undo using** to restore the default.

Syntax

using { **ce1** | **e1** }

undo using

Default

A CE1/PRI interface operates in CE1/PRI mode.

Views

CE1/PRI interface view

Predefined user roles

network-admin

Parameters

ce1: Sets the interface to operate in CE1/PRI mode.

e1: Sets the interface to operate in E1 mode.

Usage guidelines

A CE1/PRI interface can operate in either E1 mode (non-channelized mode) or CE1/PRI mode (channelized mode).

In E1 mode, the interface equals a 2.048 Mbps interface without timeslot division and has the same logical features as a synchronous serial interface. In CE1/PRI mode, the CE1/PRI interface is physically divided into 32 timeslots numbered 0 through 31, where timeslot 0 is used for FSC. This interface can operate as either a CE1 interface or a PRI interface.

After you set the CE1/PRI interface to operate in E1 mode, the system automatically creates a serial interface numbered **serial** *interface-number***:0**, where *interface-number* represents the number of the CE1/PRI interface.

Examples

Set CE1/PRI interface E1 2/0 to operate in E1 mode.

```
<Sysname> system-view
[Sysname] controller e1 2/0
[Sysname-E1 2/0] using e1
```

Basic CT1/PRI interface configuration commands

alarm-detect

Use **alarm-detect** to enable RAI detection on the interface.

Use **undo alarm-detect** to disable RAI detection on the interface.

Syntax

alarm-detect rai

undo alarm-detect rai

Default

RAI detection is enabled on an interface.

Views

CT1/PRI interface view

Predefined user roles

network-admin

Parameters

rai: Remote Alarm Indication (RAI).

Usage guidelines

This command is applicable when the framing format used on the interface is ESF.

Examples

Disable RAI detection on CT1/PR1 interface T1 2/0.

```
<Sysname> system-view
[Sysname] controller t1 2/0
[Sysname-T1 2/0] undo alarm detect rai
```

alarm-threshold

Use **alarm-threshold** to set LOS, AIS, or LFA alarm thresholds on the CT1/PRI interface.

Use **undo alarm-threshold** to restore the default.

Syntax

alarm-threshold { **ais** { **level-1** | **level-2** } | **lfa** { **level-1** | **level-2** | **level-3** | **level-4** } | **los** { **pulse-detection** | **pulse-recovery** } *value* }

undo alarm-threshold { **ais** | **lfa** | **los** { **pulse-detection** | **pulse-recovery** } }

Default

For AIS and LFA, the alarm threshold is **level-1**.

For LOS, the value of **pulse-detection** is 176 and the value of **pulse-recovery** is 22. A LOS alarm is created if the number of pulses detected within 176 pulse intervals is less than 22.

Views

CT1/PRI interface view

Predefined user roles

network-admin

Parameters

ais: Sets the alarm threshold of alarm indication signal (AIS), which can be **level-1** and **level-2**.

- The **level-1** keyword specifies generating an AIS alarm when the number of 0s in the bit stream of an SF or ESF frame is less than or equal to 2.
- The **level-2** keyword specifies generating an AIS alarm when the number of 0s is less than or equal to 3 in the bit stream of an SF frame or less than or equal to 5 in the bit stream of an ESP frame.

  Level-1 AIS alarm threshold applies.

lfa: Sets the loss of frame alignment (LFA) alarm threshold, which can be **level-1**, **level-2**, **level-3**, and **level-4**.

- The **level-1** keyword specifies generating an LFA alarm when two of four frame alignment bits are lost.
- The **level-2** keyword specifies generating an LFA alarm when two of five frame alignment bits are lost.
- The **level-3** keyword specifies generating an LFA alarm when two of six frame alignment bits are lost.
- The **level-4** keyword applies only to ESF frames. It specifies generating an LFA alarm when errors are detected in four consecutive ESF frames.

  Level-1 LFA alarm threshold applies.

los: Sets a loss of signal (LOS) alarm threshold, which can be **pulse-detection** (for the pulse detection duration threshold with LOS) and **pulse-recovery** (for the pulse threshold with LOS).

The threshold of pulse-detection, in units of pulse intervals, is in the range of 16 to 4096.

The threshold of pulse-recovery is in the range of 1 to 256.

If the number of the pulses detected during the total length of the specified pulse detection intervals is smaller than the pulse-recovery threshold, a LOS alarm occurs.

Examples

Set the number of detection intervals to 300 for the pulse detection duration threshold.

```
<Sysname> system-view
[Sysname] controller t1 2/0
[Sysname-T1 2/0] alarm-threshold los pulse-detection 300
```

bert (CT1/PRI interface)

Use **bert** to start a BERT test on a CT1/PRI interface.

Use **undo bert** to stop the BERT test running on the CT1/PRI interface.

Syntax

bert pattern { **2^20** | **2^15** } **time** *minutes* [**unframed**]

undo bert

Default

No BERT test is performed.

Views

CT1/PRI interface view

Predefined user roles

network-admin

Parameters

pattern: Sets a bit error rate test (BERT) pattern, which can be 2^15 or 2^20.

2^15: Specifies the length of transmitted BERT pattern, in bits, as two to the fifteenth power.

2^20: Specifies the length of transmitted BERT pattern, in bits, as two to the twentieth power

time *minutes*: Sets the duration (in minutes) of a BERT test. The *minutes* argument is in the range of 1 to 1,440.

unframed: Sets the test pattern to cover the overhead bits of the frame.

Usage guidelines

ITU O.151, ITU O.153, and ANSI T1.403-1999 define many BERT patterns, among which, the CT1/PRI interface supports only 2^15 and 2^20.

When running a BERT test, the local end sends out a pattern, which is to be looped over somewhere on the line and back to the local end. The local end then examines the received pattern for bit error rate to help you identify the condition of the line. You must configure loopback to allow the transmitted pattern to loop back from somewhere on the line, for example, from the far-end interface by placing the interface in a far-end loopback.

You can view the state and result of the BERT test with the **display controller t1** command.

Examples

Run a 10-minute 2^20 BERT test on CT1/PRI interface t1 2/0.

```
<Sysname> system-view
[Sysname] controller t1 2/0
[Sysname-T1 2/0] bert pattern 2^20 time 10
```

cable (CT1/PRI interface)

Use **cable** to set the cable attenuation and length on the CT1/PRI interface.

Use **undo cable** to restore the default.

Syntax

cable { **long** { **0db** | **-7.5db** | **-15db** | **-22.5db** } | **short** { **133ft** | **266ft** | **399ft** | **533ft** | **655ft** } }

undo cable

Default

The cable length is **long 0db**.

Views

CT1/PRI interface view

Predefined user roles

network-admin

Parameters

long: Matches 199.6-meter (655-feet) and longer cable length. The options for this parameter include **0db**, **-7.5db**, **-15db**, and **-22.5db**. The attenuation parameter is selected depending on the signal quality received at the receiving end. No external CSU is needed.

short: Matches a cable length shorter than 199.6 meters (655 feet). The options for this parameter include **133ft**, **266ft**, **399ft**, **533ft**, and **655ft**. The *length* argument is selected depending on the actual transmission distance.

Usage guidelines

You can use this command to adapt signal waveform to different transmission conditions such as the quality of the signal received by the receiver. If the signal quality is good, you can use the default setting. The CT1/PRI interface does not need an external CSU device.

Examples

Set the cable length to 40.5 meters (133 feet) on CT1/PRI interface T1 2/0.

```
<Sysname> system-view
[Sysname] controller t1 2/0
[Sysname-T1 2/0] cable short 133ft
```

channel-set (CT1/PRI interface)

Use **channel-set** to bundle timeslots on the CT1/PRI interface into a channel set.

Use **undo channel-set** to remove a specified or all channel sets.

Syntax

channel-set *set-number* **timeslot-list** *list* [**speed** { **56k** | **64k** }]

undo channel-set [*set-number*]

Default

No timeslots are bundled into channel sets.

Views

CT1/PRI interface view

Predefined user roles

network-admin

Parameters

set-number: Number of the channel set formed by timeslot bundling on the interface. The value is in the range of 0 to 23.

timeslot-list *list*: Specifies the timeslots to be bundled. The *list* argument can contain multiple timeslot numbers, each of which is in the range of 1 to 24. You can specify a single timeslot by specifying a timeslot number, a range of timeslots by providing this argument in the form of { *number1*-*number2* }, or multiple timeslots by providing this argument in the form of { *number1*, *number2*-*number3* }.

speed { **56k** | **64k** }: Speed of the timeslot bundle (the channel set) in kbps. If **56k** is selected, the timeslots are bundled into N × 56 kbps bundles. If **64k** (the default) is selected, the timeslots are bundled into N × 64 kbps bundles.

Usage guidelines

A CT1/PRI interface is divided into 24 timeslots numbered 1 through 24. In actual applications, all the timeslots can be bundled into multiple channel sets. For each channel set, the system automatically creates a serial interface that is logically equivalent to a synchronous serial interface.

The serial interface is named in the form of **serial** *interface-number:set-number*, where *interface-number* starts from the maximum serial interface number plus 1, and *set-number* represents the number of the channel set.

A CT1/PRI interface supports only one timeslot bundling mode at a time. In other words, you cannot use this command together with the **pri-set** command.

Examples

Bundle timeslots 1, 2, 5, 10 through 15, and 18 into channel set 0 on CT1/PRI interface T1 2/0.

```
<Sysname> system-view
[Sysname] controller t1 2/0
[Sysname-T1 2/0] channel-set 0 timeslot-list 1,2,5,10-15,18
```

Related commands

pri-set

clock (CT1/PRI interface)

Use **clock** to configure the clock source for the CT1/PRI interface.

Use **undo clock** to restore the default.

Syntax

clock { **master** | **slave** }

undo clock

Default

The clock mode is line clock (slave).

Views

CT1/PRI interface view

Predefined user roles

network-admin

Parameters

master: Adopts the internal clock as the clock source.

slave: Adopts the line clock as the clock source.

Usage guidelines

When the CT1/PRI interface is operating as a DCE, choose the internal clock for it. When it is operating as a DTE, choose the line clock for it.

When the CT1/PRI interfaces on two routers are directly connected, one interface must operate in master clock mode to provide the clock source and the other in slave clock mode to accept.

When the CT1/PRI interface on your router is connected to a switch, it is operating as a DTE and therefore must be configured with the slave clock mode to accept the line clock provided by the switch operating as a DCE.

Examples

Use the internal clock as the clock source on CT1/PRI interface T1 2/0.

```
<Sysname> system-view
[Sysname] controller t1 2/0
[Sysname-T1 2/0] clock master
```

code (CT1/PRI interface)

Use **code** to set the line code format for a CT1/PRI interface.

Use **undo code** to restore the default.

Syntax

code { **ami** | **b8zs** }

undo code

Default

The line code format for a CT1/PRI interface is B8ZS.

Views

CT1/PRI interface view

Predefined user roles

network-admin

Parameters

ami: Adopts AMI line code format.

b8zs: Adopts bipolar 8-zero substitution (B8ZS) line code format.

Usage guidelines

Keep the line code format of the interface in consistency with the one used on the remote device.

To ensure normal operation of the interface, configure the **data-coding inverted** command on it when its line code format is set to AMI.

Examples

Set the line code format of the interface T1 2/0 to AMI.

```
<Sysname> system-view
[Sysname] controller t1 2/0
[Sysname-T1 2/0] code ami
```

Related commands

data-coding

controller t1

Use **controller t1** to enter CT1/PRI interface view.

Syntax

controller t1 *number*

Views

System view

Predefined user roles

network-admin

Parameters

number: Specifies a CT1/PRI interface by its number.

Examples

Enter the view of interface T1 2/0.

```
<Sysname> system-view
[Sysname] controller t1 2/0
[Sysname-T1 2/0]
```

data-coding (CT1/PRI interface)

Use **data-coding** to enable user data inversion on the CT1/PRI interface.

Use **undo data-coding** to restore the default.

Syntax

data-coding { **inverted** | **normal** }

undo data-coding

Default

Data inversion is disabled.

Views

CT1/PRI interface view

Predefined user roles

network-admin

Parameters

inverted: Enables user data inversion.

normal: Disables user data inversion.

Usage guidelines

To prevent 7e in valid data from being taken for stuffing characters, HDLC inserts a zero after every five ones in the data stream. Then, HDLC inverts every one bit into a zero and every zero bit into a one. This makes sure at least one out of every eight bits is a one. When AMI encoding is adopted on a T1 interface, the use of data inversion can eliminate the presence of multiple consecutive zeros.

On the CT1/PRI interfaces at two ends of a T1 line, you must use the same data inversion setting.

Examples

Enable user data inversion on CT1/PRI interface T1 2/0.

```
<Sysname> system-view
[Sysname] controller t1 2/0
[Sysname-T1 2/0] data-coding inverted
```

display controller t1

Use **display controller t1** to display information about CT1/PRI interfaces.

Syntax

display controller t1 [*interface-number*]

Views

Any view

Predefined user roles

network-admin

network-operator

Parameters

interface-number: Specifies a CT1/PRI interface by its number. If you do not specify this argument, the command displays information about all CT1/PRI interfaces.

Examples

Display information about interface T1 2/0.

```
<Sysname> display controller t1 2/0
T1 2/0
Current state: DOWN
Description: T1 2/0 Interface
Basic Configuration:
  Work mode: T1 framed, Cable type: 100 Ohm balanced
  Frame-format: esf, fdl: none, Line code: b8zs
  Source clock: slave, Data-coding: normal
  Idle code: ff, Itf type: ff, Itf number: 2
  Loop back: not set
Alarm State:
  Receiver alarm state is Loss-of-Signal
  Transmitter is sending remote alarm
  Pulse density violation detected
SendLoopCode History:
  Inband-llb-up: 0 times, Inband-llb-down: 0 times
  Fdl-ansi-llb-up: 0 times, Fdl-ansi-llb-down: 0 times
  Fdl-ansi-plb-up: 0 times, Fdl-ansi-plb-down: 0 times
  Fdl-att-plb-up: 0 times, Fdl-att-plb-down: 0 times
BERT state:(stopped, not completed)
  Test pattern: 2^15, Status: Not Sync, Sync Detected: 0
    Time: 0 minutes, Time past: 0 minutes
    Bit Errors (since test started): 0 bits
```

```
    Bits Received (since test started): 0 Kbits
    Bit Errors (since latest sync): 0 bits
    Bits Received (since latest sync): 0 Kbits
Historical Statistics:
Last clearing of counters: Never
  Data in current interval (285 seconds elapsed):
    Line Code Violations: 0, Path Code Violations: 0
    Ais Alarm: 0 seconds, Los Alarm: 286 seconds
    Slip: 7 seconds, Fr Loss: 286 seconds
    Line Err: 0 seconds, Degraded: 0 minutes
    Errored: 0 seconds, Bursty Err: 0 seconds
    Severely Err: 0 seconds, Unavail: 286 seconds
  Data in Interval 1:
    Line Code Violations: 0, Path Code Violations: 0
    Ais Alarm: 0 seconds, Los Alarm Secs: 901 seconds
    Slip: 22 seconds, Fr Loss: 901 seconds
    Line Err: 0 seconds, Degraded: 0 minutes
    Errored: 0 seconds, Bursty Err: 0 seconds
    Severely Err: 0 seconds, Unavail: 901 seconds
  Data in Interval 2:
    Line Code Violations: 0, Path Code Violations: 0
    Ais Alarm: 0 seconds, Los Alarm: 900 seconds
    Slip: 23 seconds, Fr Loss: 900 seconds
    Line Err: 0 seconds, Degraded: 0 minutes
    Errored: 0 seconds, Bursty Err: 0 seconds
    Severely Err: 0 seconds, Unavail: 900 seconds
  Total Data (last 2 15 minute intervals):
    Line Code Violations: 0, Path Code Violations: 0
    Ais Alarm: 0 seconds, Los Alarm: 2087 seconds
    Slip: 52 seconds, Fr Loss: 2087 seconds
    Line Err: 0 seconds, Degraded: 0 minutes
    Errored: 0 seconds, Bursty Err: 0 seconds
    Severely Err: 0 seconds, Unavail: 2087 seconds
```

Table 15 Command output

Field	Description
T1 2/0 Current state	Physical state of the interface: up or down.
Description	Description for the T1 interface.
Basic Configuration	Basic configurations of the interface.
Work mode	Operating mode of the T1 interface.
Cable type	Cable type of the T1 interface.
Frame-format	Frame format configured on the T1 interface: ESF or SF.
fdl	FDL format: ANSI, ATT, or none.
Line code	Line code: AMI or B8ZS.

Field	Description
Source clock	Source clock used by the interface: master for the internal clock or slave for the line clock.
Data-coding	Normal or inverted.
Idle code	0x7E or 0xFF.
Itf type	Type of interframe filling tag: 0x7E or 0xFF.
Itf number	Number of interframe filling tags.
Loop back	Loopback setting on the interface: local, payload, remote, or not set.
Alarm State	Alarm state.
Receiver alarm state is Loss-of-Signal	Type of received alarm: none, LOS, LOF, RAI, or AIS.
Transmitter is sending remote alarm.	Type of transmitted alarm: RAI, or none.
Pulse density violation detected	The detected pulse density is incompliant with the specification.
SendLoopCode History: Inband-llb-up: 0 times, Inband-llb-down: 0 times Fdl-ansi-llb-up: 0 times, Fdl-ansi-llb-down: 0 times Fdl-ansi-plb-up: 0 times, Fdl-ansi-plb-down: 0 times Fdl-att-plb-up: 0 times, Fdl-att-plb-down: 0 times	History of loopback code sending to the peer end, including the number of transmissions for each type of code, and the type of the last sent code.
BERT state	BERT state: completed, stopped (not completed), or running.
Test pattern	Test pattern in use (2^20 or 2^15).
Status	Whether is synchronization is being performed.
Sync Detected	Number of detected synchronizations.
Time	Duration of the BERT test.
Time past	Time that has elapsed.
Bit Errors (since test started)	Number of bit errors received since start of the BERT test.
Bits Received (since test started)	Number of bits received since start of the BERT test.
Bit Errors (since latest sync)	Number of bit errors received since last synchronization.
Bits Received (since latest sync)	Number of bits received since last synchronization.
Historical Statistics	Historical statistics.
Last clearing of counters	Counter clearing records.

Field	Description
Data in current interval (285 seconds elapsed): Line Code Violations: 0, Path Code Violations: 0 Ais Alarm: 0 seconds, Los Alarm: 286 seconds Slip: 7 seconds, Fr Loss: 286 seconds Line Err: 0 seconds, Degraded: 0 minutes Errored: 0 seconds, Bursty Err: 0 seconds Severely Err: 0 seconds, Unavail: 286 seconds	Statistics in the current interval. The statistical items, such as AIS alarm, LOS signal, and LFA, are provided according to the T1 specifications for the physical layer. For more information, see ANSI T1.403 and AT&T TR 54016.
Data in Interval 1: Line Code Violations: 0, Path Code Violations: 0 Ais Alarm: 0 seconds, Los Alarm Secs: 901 seconds Slip: 22 seconds, Fr Loss: 901 seconds Line Err: 0 seconds, Degraded: 0 minutes Errored: 0 seconds, Bursty Err: 0 seconds Severely Err: 0 seconds, Unavail: 901 seconds	Statistics spanning the first interval. The statistical items are the same as those provided by the statistics spanning the current interval.
Data in Interval 2: Line Code Violations: 0, Path Code Violations: 0 Ais Alarm: 0 seconds, Los Alarm: 900 seconds Slip: 23 seconds, Fr Loss: 900 seconds Line Err: 0 seconds, Degraded: 0 minutes Errored: 0 seconds, Bursty Err: 0 seconds Severely Err: 0 seconds, Unavail: 900 seconds	Statistics spanning the second interval. The statistical items are the same as those provided by the statistics spanning the current interval.
Total Data (last 2 15 minute intervals): Line Code Violations: 0, Path Code Violations: 0 Ais Alarm: 0 seconds, Los Alarm: 2087 seconds Slip: 52 seconds, Fr Loss: 2087 seconds Line Err: 0 seconds, Degraded: 0 minutes Errored: 0 seconds, Bursty Err: 0 seconds Severely Err: 0 seconds, Unavail: 2087 seconds	Statistics spanning the last two intervals. The statistical items are the same as those provided by the statistics spanning the current interval.

Related commands

reset counters controller t1

fdl

Use **fdl** to set the behavior of the CT1/PRI interface on the FDL in ESF framing.

Use **undo fdl** to restore the default.

Syntax

fdl { **ansi** | **att** | **both** | **none** }

undo fdl

Default

FDL is disabled (none).

Views

CT1/PRI interface view

Predefined user roles

network-admin

Parameters

ansi: Adopts ANSI T1.403 for facilities data link (FDL).

att: Adopts AT&T TR 54016 for FDL.

both: Adopts both ANSI T1.403 and AT&T TR 54016 for FDL.

none: Disables FDL.

Usage guidelines

Facility Data Link (FDL) is an embedded 4 kbps overhead channel within the ESF format for transmitting alarm information, performance statistics, or loopback code. FDL uses ANSI T1.403 and ATT TR 54016. In application,

You can change the setting depending on the setting at the far end.

Examples

Implement AT&T FDL on interface T1 2/0.

```
<Sysname> system-view
[Sysname] controller t1 2/0
[Sysname-T1 2/0] fdl att
```

frame-format (CT1/PRI interface)

Use **frame-format** to set the framing format on a CT1/PRI interface.

Use **undo frame-format** to restore the default.

Syntax

frame-format { **esf** | **sf** }

undo frame-format

Default

The framing format on a CT1/PRI interface is **esf**.

Views

CT1/PRI interface view

Predefined user roles

network-admin

Parameters

esf: Sets the framing format to ESF.

sf: Sets the framing format to super frame (SF).

Usage guidelines

CT1/PRI interfaces support two framing formats, SF and ESF. In SF format, multiple frames can share the same FSC and signaling information, so that more significant bits are available for transmitting user data. The use of ESF allows you to test the system without affecting the ongoing service.

Examples

Set the framing format of interface T1 2/0 to SF.

```
<Sysname> system-view
[Sysname] controller t1 2/0
[Sysname-T1 2/0] frame-format sf
```

idle-code (CT1/PRI interface)

Use **idle-code** to set the line idle code on the CT1/PRI interface. Two types of line idle code are available: 0x7E and 0xFF.

Use **undo idle-code** to restore the default.

Syntax

Idle-code { **7e** | **ff** }

undo idle-code

Default

The line idle code is 0x7E.

Views

CT1/PRI interface view

Predefined user roles

network-admin

Parameters

7e: Sets the line idle code to 0x7E.

ff: Sets the line idle code to 0xFF.

Usage guidelines

The line idle code is sent in the timeslots that are not bundled into the logical channels on the interface.

Examples

Set the line idle code to 0x7E on CT1/PRI interface T1 2/0.

```
<Sysname> system-view
[Sysname] controller t1 2/0
[Sysname-T1 2/0] idlecode 7e
```

itf (CT1/PRI interface)

Use **itf** to set the type and the number of interframe filling tags on the CT1/PRI interface. Two types of interframe filling tag are available: 0x7E and 0xFF.

Use **undo itf** to restore the default.

Syntax

itf { **number** *number* | **type** { **7e** | **ff** } }

undo itf { **number** | **type** }

Default

The interframe filling tag is 0x7E, and the number of interframe filling tags is 4.

Views

CT1/PRI interface view

Predefined user roles

network-admin

Parameters

number *number*: Sets the number of interframe filling tags (an interframe filling tag is one byte in length), in the range of 0 to 14.

type { **7e** | **ff** }: Sets the interframe filling tag to 0x7E by specifying the **7e** keyword or to 0xFF by specifying the **ff** keyword. On CT1/PRI interfaces, the default interframe filling tag is 0x7E.

Usage guidelines

Interframe filling tags are sent when no service data is sent on the timeslots bundled into logical channels on a CT1/PRI interface.

Examples

Set the interframe filling tag to 0xFF on CT1/PRI interface T1 2/0.

```
<Sysname> system-view
[Sysname] controller t1 2/0
[Sysname-T1 2/0] itf type ff
```

Set the number of interframe filling tags to 5 on CT1/PRI interface T1 2/0.

```
<Sysname> system-view
[Sysname] controller t1 2/0
[Sysname-T1 2/0] itf number 5
```

loopback (CT1/PRI interface)

Use **loopback** to enable local, remote, or external payload loopback on the CT1/PRI interface.

Use **undo loopback** to restore the default.

Syntax

loopback { **local** | **payload** | **remote** }

undo loopback

Default

Loopback is disabled.

Views

CT1/PRI interface view

Predefined user roles

network-admin

Parameters

local: Enables the CT1/PRI interface to perform local loopback.

payload: Enables the interface to perform external payload loopback.

remote: Enables the interface to perform remote loopback.

Usage guidelines

Loopback is mainly used to check the condition of interfaces or cables. Disable loopback in other cases.

You can bundle timeslots on a CT1/PRI interface to form a serial interface and encapsulate it with PPP. After you enable loopback on this serial interface, it is normal that the state of the link layer protocol is reported down.

Examples

Enable local loopback on interface T1 2/0.

```
<Sysname> system-view
[Sysname] controller t1 2/0
[Sysname-T1 2/0] loopback local
```

pri-set (CT1/PRI interface)

Use **pri-set** to bundle timeslots into a PRI set on the CT1/PRI interface.

Use **undo pri-set** to remove the timeslot bundle.

Syntax

pri-set [**timeslot-list** *list*]

undo pri-set

Default

No PRI set is created.

Views

CT1/PRI interface view

Predefined user roles

network-admin

Parameters

timeslot-list *list*: Specifies timeslots to be bundled. Timeslots are numbered 1 through 24. You can specify a single timeslot by specifying a number, a range of timeslots by specifying a range in the form of *number1*-*number2*, or several discrete timeslots by specifying *number1*, *number2*-*number3*.

Usage guidelines

When you create a PRI set on a CT1/PRI interface, timeslot 24 is the D channel for transmitting signaling, and it cannot form a bundle that includes itself only. The attempts to bundle only timeslot 24 will fail.

In the created PRI set, timeslot 24 is used as D channel for signaling transmission, and the other timeslots as B channels for data transmission. You can randomly bundle these timeslots into a PRI set (as the D channel, timeslot 24 is automatically bundled). If no timeslot is specified, all timeslots are bundled into an interface similar to an ISDN PRI interface in the form of 23B+D.

For the PRI set, the system automatically creates a serial interface that is logically equivalent to an ISDN PRI interface. The serial interface is named in the form of **serial** *number*:**23**, where *number* is the number of the CT1/PRI interface on which the serial interface is created.

Because a channel set and a PRI set cannot coexist on a CT1/PRI interface, your PRI set creation attempt will fail if the **channel-set** command is configured.

Examples

Bundle timeslots 1, 2, and 8 through 12 into a PRI set on CT1/PRI interface T1 2/0.

```
<Sysname> system-view
[Sysname] controller t1 2/0
[Sysname-T1 2/0] pri-set timeslot-list 1,2,8-12
```

Related commands

channel-set

reset counters controller t1

Use **reset counters controller t1** to clear the controller counter for a CT1/PRI interface.

Syntax

reset counters controller t1 [*interface-number*]

Views

User view

Predefined user roles

network-admin

Parameters

interface-number: Specifies a CT1/PRI interface by its number. If you do not specify this argument, the command clears the controller counter for all CT1/PRI interfaces.

Usage guidelines

The **reset counters interface** command clears the counters of all interfaces. To clear the controller counter of individual CT1/PRI interfaces, use the **reset counters controller t1** command.

Examples

Clear the controller counter for CT1/PRI interface T1 2/0.

```
<Sysname> reset counters controller t1 2/0
```

Related commands

display controller t1

sendloopcode

Use **sendloopcode** to send remote loopback control code.

Syntax

sendloopcode { **fdl-ansi-llb-down** | **fdl-ansi-llb-up** | **fdl-ansi-plb-down** | **fdl-ansi-plb-up** | **fdl-att-plb-down** | **fdl-att-plb-up** | **inband-llb-down** | **inband-llb-up** }

Default

No remote loopback control code is sent.

Views

CT1/PRI interface view

Predefined user roles

network-admin

Parameters

fdl-ansi-llb-down: Sends ANSI-compliant LLB deactivation request code in the FDL to remove loopback.

fdl-ansi-llb-up: Sends ANSI-compliant line loopback (LLB) activation request code in the FDL to start remote loopback.

fdl-ansi-plb-down: Sends ANSI-compliant PLB deactivation request code in the FDL to remove loopback.

fdl-ansi-plb-up: Sends ANSI-compliant payload loopback (PLB) activation request code in the FDL to start remote loopback.

fdl-att-plb-down: Sends AT&T-complaint PLB deactivation request code in the FDL to remove loopback.

fdl-att-plb-up: Sends AT&T-complaint PLB activation request code in the FDL to start remote loopback.

inband-llb-down: Sends in-band LLB deactivation request code in compliance with the ANSI or AT&T implementation to remove loopback.

inband-llb-up: Sends in-band line loopback (LLB) activation request code compliant with the ANSI and AT&T implementation to start remote loopback.

Usage guidelines

You can configure loopback on the remote CT1/PRI interface by sending loopback request code.

In LLB mode, all 193 bits (one synchronization bit and 192 effective bandwidth bits) in a T1 PCM frame are looped back. In PLB mode, however, only 192 effective bandwidth bits are looped back.

The format of loopback code is compliant with ANSI T1.403 or AT&T TR 54016.

In SF framing, LLB code is sent using the effective bandwidth. In ESF framing, both LLB code and PLB code are sent and received in the FDL.

Use this command in conjunction with the far-end T1 device. The far-end device must be able to set loopback mode depending on the detected loopback code. The sending of remote loopback control code lasts five minutes without affecting the operation of other interfaces.

Examples

Send in-band LLB activation request code.

```
<Sysname> system-view
[Sysname] controller t1 2/0
[Sysname-T1 2/0] sendloopcode inband-llb-up
```

E1-F interface configuration commands

clock-change auto

Use **clock-change auto** to enable the automatic clock mode change function on the interface to configure the interface that uses the slave clock mode to automatically switch to the master clock mode when receiving an alarm indication signal (AIS)/loss of signal (LOS)/loss of frame (LOF) alarm. After the alarm is cleared, the interface automatically switches back to the user-configured clock mode.

Use **undo clock-change auto** to disable the automatic clock mode change function. If the interface has already switched its clock mode, this command restores the user-configured clock mode for the interface.

Syntax

clock-change auto

undo clock-change auto

Default

Automatic clock mode change is disabled.

Views

E1-F interface view

Predefined user roles

network-admin

Examples

Enable automatic clock mode change for E1-F interface Serial 2/0.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] clock-change auto
```

Related commands

fe1 clock

crc

Use **crc** to configure CRC mode for an E1-F interface.

Use **undo crc** to restore the default.

Syntax

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

undo crc

Default

The CRC mode for an E1-F interface is 16-bit CRC.

Views

E1-F interface view

Predefined user roles

network-admin

Parameters

16: Adopts 16-bit CRC.

32: Adopts 32-bit CRC.

none: Disables CRC.

Examples

Adopt 32-bit CRC on E1-F interface Serial 2/0.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] crc 32
```

display fe1

Use **display fe1** to display information about E1-F interfaces.

Syntax

display fe1 [**serial** *interface-number*]

Views

Any view

Predefined user roles

network-admin

network-operator

Parameters

serial *interface-number*: Specifies a serial interface by its number. If you do not specify any interface, this command displays information about all E1-F interfaces.

Usage guidelines

If the specified interface is a common serial interface rather than an E1-F interface, the system displays a prompt.

Examples

Display information about E1-F interface Serial 2/0.

```
<Sysname> display fe1 serial 2/0
Serial2/0
  Basic Configuration:
    Work mode: E1 framed, Cable type: 75 Ohm unbalanced
    Frame format: no-crc4
    Line code: hdb3, Source clock: slave
    Idle code: 7e, Itf type: 7e, Itf number: 4
    Loopback: not set
  Alarm State:
    Receiver alarm state is None.
    Transmitter is sending remote alarm.
  Historical Statistics:
```

```
Last clearing of counters: Never
Data in current interval (19349 seconds elapsed):
  Loss Frame Alignment: 129 seconds, Framing Error: 0 seconds
  CRC Error: 0 seconds, Alarm Indication: 0 seconds
  Loss-of-signals: 129 seconds, Code Violations: 0 seconds
  Slip: 0 seconds, E-Bit Error: 0 seconds
```

Table 16 Command output

Field	Description
Cable type	Cable type of the interface (75-ohm unbalanced/120-ohm balanced).
Frame-format	Framing format: CRC4 or no-CRC4.
Line Code	Line code format: AMI or HDB3.
Source Clock	Source clock: master for internal clock and slave for line clock.
Idle code	Idle code: 7e or ff.
Itf type	Interframe filling tag: 7e or ff.
Itf number	Number of Interframe filling tags.
Loopback	Whether loopback is configured on the interface.
Alarm State	Alarm status.
Last clearing of counters	Last time when the interface statistics is cleared.
Data in current interval (19349 seconds elapsed): Loss Frame Alignment: 129 seconds, Framing Error: 0 seconds CRC Error: 0 seconds, Alarm Indication: 0 seconds Loss-of-signals: 129 seconds, Code Violations: 0 seconds Slip: 0 seconds, E-Bit Error: 0 seconds	Time duration that each error lasts within the interval. The errors include frame misalignment, frame errors, alarms, loss of signals, code violation, and frame slipping.

fe1 alarm-detect

Use **fe1 alarm-detect** to enable RAI detection on the interface.

Use **undo fe1 alarm-detect** to disable RAI detection on the interface.

Syntax

fe1 alarm-detect rai

undo fe1 alarm-detect rai

Default

RAI detection is enabled on an E1-F interface.

Views

E1-F interface view

Predefined user roles

network-admin

Parameters

rai: Remote Alarm Indication (RAI).

Usage guidelines

This command is applicable when the interface operates in framed mode.

Examples

Disable RAI detection on interface Serial 2/0.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] undo fe1 alarm-detect rai
```

Related commands

fe1 unframed

fe1 cable

Use **fe1 cable** to set the cable length for an E1-F interface.

Use **undo fe1 cable** to restore the default.

Syntax

fe1 cable { **long** | **short** }

undo fe1 cable

Default

The **long** keyword applies.

Views

E1-F interface view

Predefined user roles

network-admin

Parameters

long: Supports long cables.

short: Supports short cables.

Examples

Set the cable length type on E1-F interface Serial 2/0 to **short**.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] fe1 cable short
```

fe1 clock

Use **fe1 clock** to configure clock source for the E1-F interface.

Use **undo fe1 clock** to restore the default.

Syntax

fe1 clock { **master** | **slave** }

undo fe1 clock

Default

The clock source for the E1-F interface is line clock (slave).

Views

E1-F interface view

Predefined user roles

network-admin

Parameters

master: Adopts the internal clock as the clock source.

slave: Adopts the line clock as the clock source.

Usage guidelines

When the E1-F interface is operating as a DCE, choose the internal clock (**master**) for it. When it is operating as a DTE, choose the line clock for it.

Examples

Use the internal clock as the clock source on E1-F interface Serial 2/0.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] fe1 clock master
```

Related commands

clock-change auto

fe1 code

Use **fe1 code** to set the line code format for the E1-F interface.

Use **undo fe1 code** to restore the default.

Syntax

fe1 code { **ami** | **hdb3** }

undo fe1 code

Default

The line code format for the E1-F interface is HDB3.

Views

E1-F interface view

Predefined user roles

network-admin

Parameters

ami: Adopts AMI line code format.

hdb3: Adopts HDB3 line code format.

Usage guidelines

Keep the line code format of the interface in consistency with the one used on the remote device.

To ensure normal operation of the interface, configure the **fe1 data-coding inverted** command on it when its line code format is set to AMI.

Examples

Set the line code format of E1-F interface Serial 2/0 to AMI.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] fe1 code ami
```

Related commands

fe1 data-coding

fe1 data-coding

Use **fe1 data-coding** to enable or disable user data inversion for an E1-F interface.

Use **undo fe1 data-coding** to restore the default.

Syntax

fe1 data-coding { **inverted** | **normal** }

undo fe1 data-coding

Default

Data inversion is disabled.

Views

E1-F interface view

Predefined user roles

network-admin

Parameters

inverted: Enables user data inversion.

normal: Disables user data inversion.

Usage guidelines

To prevent 7e in valid data from being taken for stuffing characters, HDLC inserts a zero after every five ones in the data stream. Then, HDLC inverts every one bit into a zero and every zero bit into a one. This ensures that at least at least one out of every eight bits is a one. When AMI encoding is adopted on an E1-F interface, the use of data inversion can eliminate presence of multiple consecutive zeros.

At the two ends of an E1-F line, the same data inversion setting must be adopted.

Examples

Enable user data inversion on E1-F interface Serial 2/0.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] fe1 data-coding inverted
```

Related commands

fe1 code

fe1 detect-ais

Use **fe1 detect-ais** to enable AIS test on an interface.

Use **undo fe1 detect-ais** to disable AIS test.

Syntax

fe1 detect-ais

undo fe1 detect-ais

Default

AIS test is performed.

Views

E1-F interface view

Predefined user roles

network-admin

Usage guidelines

This command is available when the E1-F interface is operating in unframed mode.

Examples

Enable AIS test on E1-F interface Serial 2/0.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] fe1 detect-ais
```

Related commands

fe1 unframed

fe1 frame-format

Use **fe1 frame-format** to configure the framing format of the E1-F interface.

Use **undo fe1 frame-format** to restore the default.

Syntax

fe1 frame-format { **crc4** | **no-crc4** }

undo fe1 frame-format

Default

The framing format of the E1-F interface is no-CRC4.

Views

E1-F interface view

Predefined user roles

network-admin

Parameters

crc4: Sets framing format to CRC4.

no-crc4: Sets framing format to no-CRC4.

Usage guidelines

An E1-F interface in framed mode supports both CRC4 and no-CRC4 framing formats, where CRC4 supports four-bit CRC on physical frames but no-CRC4 does not.

Examples

Set the framing format of E1-F interface Serial 2/0 to **crc4**.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] fe1 frame-format crc4
```

Related commands

fe1 unframed

fe1 idle-code

Use **fe1 idle-code** to set the line idle code on the E1-F interface. Two types of line idle code are available: 0x7E and 0xFF.

Use **undo fe1 idle-code** to restore the default.

Syntax

fe1 idle-code { **7e** | **ff** }

undo fe1 idle-code

Default

The line idle code on the E1-F interface is 0x7E.

Views

E1-F interface view

Predefined user roles

network-admin

Parameters

7e: Sets the line idle code to 0x7E.

ff: Sets the line idle code to 0xFF.

Usage guidelines

The line idle code is sent in the timeslots that are not bundled into the logical channels on the interface.

Examples

Set the line idle code to 0x7E on E1-F interface Serial 2/0.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] fe1 idlecode 7e
```

fe1 itf

Use **fe1 itf** to set the type of and the number of interframe filling tags on the E1-F interface. Two types of interframe filling tag are available: 0x7E and 0xFF.

Use **undo fe1 itf** to restore the default.

Syntax

fe1 itf { **number** *number* | **type** { **7e** | **ff** } }

undo fe1 itf { **number** | **type** }

Default

The interframe filling tag is 0x7E and the number of interframe filling tags is 4.

Views

E1-F interface view

Predefined user roles

network-admin

Parameters

number *number*: Sets the number of interframe filling tags (an interframe filling tag is one byte in length), in the range of 0 to 14.

type { **7e** | **ff** }: Sets the type of interframe filling tag to 0x7E by specifying the **7e** keyword or to 0xFF by specifying the **ff** keyword. The default is 0x7E.

Usage guidelines

Interframe filling tags are sent when no service data is sent on the timeslots bundled into the logical channel on the E1-F interface.

Examples

Set the type of interframe filling tag to 0xFF on E1-F interface Serial 2/0.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] fe1 itf type ff
```

Set the number of interframe filling tags to 5 on E1-F interface Serial 2/0.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] fe1 itf number 5
```

fe1 loopback

Use **fe1 loopback** to set the E1-F interface in a loopback mode.

Use **undo fe1 loopback** to restore the default.

Syntax

fe1 loopback { **local** | **payload** | **remote** }

undo fe1 loopback

Default

Loopback is disabled.

Views

E1-F interface view

Predefined user roles

network-admin

Parameters

local: Sets the interface to operate in internal loopback mode.

payload: Sets the interface to operate in external payload loopback mode.

remote: Sets the interface to operate in external loopback mode.

Usage guidelines

Loopback checks the condition of interfaces or cables. Disable loopback in other cases.

The three loopback modes cannot be used simultaneously on an E1-F interface.

Examples

Set E1-F interface Serial 2/0 to operate in internal loopback mode.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] fe1 loopback local
```

fe1 timeslot-list

Use **fe1 timeslot-list** to bundle timeslots on the E1-F interface.

Use **undo fe1 timeslot-list** to restore the default.

Syntax

fe1 timeslot-list *list*

undo fe1 timeslot-list

Default

All the timeslots on the E1-F interface are bundled to form a 1984 kbps interface.

Views

E1-F interface view

Predefined user roles

network-admin

Parameters

list: Specifies timeslots to be bundled. They are numbered 1 through 31. You can specify a single timeslot by specifying its number, a range of timeslots by specifying a range in the form of *number1*-*number2*, or several discrete timeslots by specifying *number1*, *number2*-*number3*.

Usage guidelines

Timeslot bundling results in interface rate change. For example, after you bundle timeslots 1 through 10 on the interface, the interface rate becomes 10 × 64 kbps.

Only one channel set can be created on an E1-F interface, and this channel set is associated with the current synchronous serial interface. On a CE1/PRI interface, you can create multiple channel sets. For each of them, the system automatically creates a synchronous serial interface.

Timeslot 0 on E1-F interfaces is used for transmitting synchronization information. A bundling operation only involves timeslots 1 through 31.

When the E1-F interface is operating in unframed mode, the **fe1 timeslot-list** command is invalid.

Examples

Bundle timeslots 1, 2, 5, 10 through 15, and 18 on E1-F interface Serial 2/0.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] fe1 timeslot-list 1,2,5,10-15,18
```

Related commands

fe1 unframed

fe1 unframed

Use **fe1 unframed** to configure the E1-F interface to operate in unframed mode.

Use **undo fe1 unframed** to restore the default.

Syntax

fe1 unframed

undo fe1 unframed

Default

The E1-F interface operates in framed mode.

Views

E1-F interface view

Predefined user roles

network-admin

Usage guidelines

When the E1-F interface is operating in unframed mode, it is a 2048 kbps interface without timeslot division and is logically equivalent to a synchronous serial interface.

When it is operating in framed mode, it is physically divided into 32 timeslots numbered 0 through 31, where timeslot 0 is used for synchronization.

Examples

Set E1-F interface Serial 2/0 to operate in unframed mode.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] fe1 unframed
```

Related commands

fe1 timeslot-list

mtu

Use **mtu** to set the MTU of an E1-F interface.

Use **undo mtu** to restore the default.

Syntax

mtu *size*

undo mtu

Default

The MTU of an E1-F interface is 1500 bytes.

Views

E1-F interface view

Predefined user roles

network-admin

Parameters

size: MTU of the current interface, in the range of 128 to 1650 bytes.

Usage guidelines

To validate your MTU setting, shut down and then bring up the interface with the **shutdown** and **undo shutdown** commands.

Examples

Set the MTU of the E1-F interface Serial 2/0 to 1430 bytes.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] mtu 1430
```

reset counters interface

Use **reset counters interface** to clear statistics on the specified interface.

Syntax

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

Views

User view

Predefined user roles

network-admin

Parameters

serial *interface-number*: Specifies a serial interface by its number.

Usage guidelines

When you collect traffic statistics for a specific period of time on a BRI interface, clear the existing statistics on the interface.

- If you do not specify the **serial** keyword, this command clears statistics on all interfaces.
- If you specify the **serial** keyword without the *interface-number* argument, this command clears statistics on all serial interfaces.
- If you specify both the **serial** keyword and the *interface-number* argument, this command clears statistics on a specified serial interface.

Examples

Clear statistics on interface Serial 2/0.

```
<Sysname> reset counters interface serial 1/0
```

T1-F interface configuration commands

crc

Use **crc** to configure CRC mode for a synchronous serial interface formed on a CT1/PRI interface.

Use **undo crc** to restore the default.

Syntax

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

undo crc

Default

The CRC mode for a synchronous serial interface formed on a CT1/PRI interface is 16-bit CRC.

Views

T1-F interface view

Predefined user roles

network-admin

Parameters

16: Adopts 16-bit CRC.

32: Adopts 32-bit CRC.

none: Disables CRC.

Examples

Adopt 32-bit CRC on T1-F interface Serial 2/0.

```
<Sysname> system-view
[Sysname] interface serial 2/0
```

```
[Sysname-Serial2/0] crc 32
```

display ft1

Use **display ft1** to display information about a T1-F interface.

Syntax

display ft1 [**serial** *interface-number*]

Views

Any view

Predefined user roles

network-admin

network-operator

Parameters

serial *interface-number*: Specifies a T1-F interface by its number. If you do not specify any interface, this command displays information about all T1-F interfaces.

Usage guidelines

If the specified interface is a common serial interface rather than a T1-F interface, the system displays a prompt.

Examples

Display information about T1-F interface Serial 2/0.

```
<Sysname> display ft1 serial 2/0
Serial2/0
Input:
  0 packets, 0 bytes
  0 broadcasts, 0 multicasts
  0 errors, 0 runts, 0 giants
  0 CRC, 0 align errors, 0 overruns
  0 aborts, 0 no buffers
  0 frame errors
Output:
  0 packets, 0 bytes
  0 errors, 0 underruns, 0 collisions
  0 deferred
Basic Configuration:
  Work mode: T1 framed, Cable type: 100 Ohm balanced
  Frame-format: esf, fdl: none, Line code: b8zs
  Source clock: slave, Data-coding: normal
  Idle code: ff, Itf type: ff, Itf number: 2
  Loopback: not set
Alarm State:
  Receiver alarm state is Loss-of-Signal.
  Transmitter is sending remote alarm.
  Pulse density violation detected.
SendLoopCode History:
```

```
  Inband-llb-up: 0 times, Inband-llb-down: 0 times
  Fdl-ansi-llb-up: 0 times, Fdl-ansi-llb-down: 0 times
  Fdl-ansi-plb-up: 0 times, Fdl-ansi-plb-down: 0 times
  Fdl-att-plb-up: 0 times, Fdl-att-plb-down: 0 times
BERT state: stopped
  Test pattern: 2^15, Status: Not Sync, Sync Detected: 0
    Time: 0 minutes, Time past: 0 minutes
    Bit Errors (since test started): 0 bits
    Bits Received (since test started): 0 Kbits
    Bit Errors (since latest sync): 0 bits
    Bits Received (since latest sync): 0 Kbits
Historical Statistics:
  Last clearing of counters: Never
  Data in current interval (285 seconds elapsed):
    Line Code Violations: 0, Path Code Violations: 0
    Ais Alarm: 0 seconds, Los Alarm: 286 seconds
    Slip: 7 seconds, Fr Loss: 286 seconds
    Line Err: 0 seconds, Degraded: 0 minitues
    Errored: 0 seconds, Bursty Err: 0 seconds
    Severely Err: 0 seconds, Unavail: 286 seconds
  Data in Interval 1:
    Line Code Violations: 0, Path Code Violations: 0
    Ais Alarm: 0 seconds, Los Alarm: 901 seconds
    Slip: 22 seconds, Fr Loss: 901 seconds
    Line Err: 0 seconds, Degraded: 0 minitues
    Errored: 0 seconds, Bursty Err: 0 seconds
    Severely Err: 0 seconds, Unavail: 901 seconds
  Data in Interval 2:
    Line Code Violations: 0, Path Code Violations: 0
    Ais Alarm: 0 seconds, Los Alarm: 900 seconds
    Slip: 23 seconds, Fr Loss: 900 seconds
    Line Err: 0 seconds, Degraded: 0 minitues
    Errored: 0 seconds, Bursty Err: 0 seconds
    Severely Err: 0 seconds, Unavail: 900 seconds
  Total Data (last 2 15 minute intervals):
    Line Code Violations: 0, Path Code Violations: 0
    Ais Alarm: 0 seconds, Los Alarm: 2087 seconds
    Slip: 52 seconds, Fr Loss: 2087 seconds
    Line Err: 0 seconds, Degraded: 0 minitues
    Errored: 0 seconds, Bursty Err: 0 seconds
    Severely Err: 0 seconds, Unavail: 2087 seconds
```

Table 17 Command output

Field	Description
Input/Output	Statistics about the input and output.
Basic Configuration	Basic configurations for the interface.
Work mode	T1 interface operating mode: T1 or CT1.

Field	Description
Cable type	Cable type of the interface, 100 ohm balanced in this sample output.
Frame-format	Frame format configured on the interface: ESF or SF.
fdl	FDL format: ANSI, ATT, or none.
Line code	AMI or B8ZS.
Source Clock	Source clock used by the interface: master for the internal clock or slave for the line clock.
Data-coding	Normal or inverted.
Idle code	Idle code: 0x7E or 0xFF.
Itf type	Type of inter-frame filling tags: 0x7E or 0xFF.
Itf number	Number of inter-frame filling tags.
Loop back	Loopback setting on the interface: local, payload, remote, or not set.
Alarm State	Alarm state.
Receiver alarm state is Loss-of-Signal	Type of received alarm: none, LOS, LOF, RAI, or AIS.
Transmitter is sending remote alarm	Type of transmitted alarm: RAI or none.
Pulse density violation detected	The detected pulse density is incompliant with the specification.
SendLoopCode History: Inband-llb-up: 0 times, Inband-llb-down: 0 times Fdl-ansi-llb-up: 0 times, Fdl-ansi-llb-down: 0 times Fdl-ansi-plb-up: 0 times, Fdl-ansi-plb-down: 0 times Fdl-att-plb-up: 0 times, Fdl-att-plb-down: 0 times	History of loopback code sending to the far-end, including the number of transmissions for each type of code, and the type of the last sent code. (For more information, see "ft1 sendloopcode.")
BERT state	BERT state: completed, stopped (administratively stopped), or running.
Test pattern	Test pattern in use: 2^15 or 2^20.
Status	Whether is being synchronized.
Sync Detected	Number of detected synchronizations.
Time	Duration of the BERT test.
Time past	Time that has elapsed.
Bit Errors (since test started)	Number of bit errors received since start of the BERT test.
Bits Received (since test started)	Number of bits received since start of the BERT test.
Bit Errors (since latest sync)	Number of bit errors received since last synchronization.
Bits Received (since latest sync)	Number of bits received since last synchronization.
Historical Statistics:	Historical statistics.
Last clearing of counters	Counter clearing records.

Field	Description
Data in current interval (285 seconds elapsed): Line Code Violations: 0, Path Code Violations: 0 Ais Alarm: 0 seconds, Los Alarm: 286 seconds Slip: 7 seconds, Fr Loss: 286 seconds Line Err: 0 seconds, Degraded: 0 minitues Errored: 0 seconds, Bursty Err: 0 seconds Severely Err: 0 seconds, Unavail: 286 seconds	Statistics spanning the current interval. The statistical items, such as AIS alarm, LOS signal, and LFA, are provided according to the T1 specifications for the physical layer. For more information, see ANSI T1.403 and AT&T TR 54016.
Data in Interval 1: Line Code Violations: 0, Path Code Violations: 0 Ais Alarm: 0 seconds, Los Alarm: 901 seconds Slip: 22 seconds, Fr Loss: 901 seconds Line Err: 0 seconds, Degraded: 0 minitues Errored: 0 seconds, Bursty Err: 0 seconds Severely Err: 0 seconds, Unavail: 901 seconds	Statistics spanning the first interval. The statistical items are the same as those provided by the statistics spanning the current interval.
Data in Interval 2: Line Code Violations: 0, Path Code Violations: 0 Ais Alarm: 0 seconds, Los Alarm: 900 seconds Slip: 23 seconds, Fr Loss: 900 seconds Line Err: 0 seconds, Degraded: 0 minitues Errored: 0 seconds, Bursty Err: 0 seconds Severely Err: 0 seconds, Unavail: 900 seconds	Statistics spanning the second interval. The statistical items are the same as those provided by the statistics spanning the current interval.
Total Data (last 2 15 minute intervals): Line Code Violations: 0, Path Code Violations: 0 Ais Alarm: 0 seconds, Los Alarm: 2087 seconds Slip: 52 seconds, Fr Loss: 2087 seconds Line Err: 0 seconds, Degraded: 0 minitues Errored: 0 seconds, Bursty Err: 0 seconds Severely Err: 0 seconds, Unavail: 2087 seconds	Statistics spanning the last two intervals. The statistical items are the same as those provided by the statistics spanning the current interval.

ft1 alarm-detect

Use **ft1 alarm-detec** to enable RAI detection on the interface.

Use **undo ft1 alarm-detect** to disable RAI detection on the interface.

Syntax

ft1 alarm-detect rai

undo ft1 alarm-detect rai

Default

RAI detection is enabled on an interface.

Views

T1-F interface view

Predefined user roles

network-admin

Parameters

rai: Remote Alarm Indication (RAI).

Usage guidelines

This command is applicable when the framing format on the interface is ESF.

Examples

Disable RAI detection on interface Serial 2/0.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] undo ft1 alarm-detect rai
```

Related commands

ft1 frame-format

ft1 alarm-threshold

Use **ft1 alarm-threshold** to set LOS, AIS, or LFA alarm thresholds on the T1-F interface.

Use **undo ft1 alarm-threshold** to restore the default.

Syntax

ft1 alarm-threshold { **ais** { **level-1** | **level-2** } | **lfa** { **level-1** | **level-2** | **level-3** | **level-4** } | **los** { **pulse-detection** | **pulse-recovery** } *value* }

undo ft1 alarm-threshold { **ais** | **lfa** | **los** { **pulse-detection** | **pulse-recovery** } }

Default

For AIS and LFA, the alarm threshold is **level-1**.

For LOS, the value of **pulse-detection** is 176 and the value of **pulse-recovery** is 22. A LOS alarm is created if the number of pulses detected within 176 pulse intervals is less than 22.

Views

T1-F interface view

Predefined user roles

network-admin

Parameters

ais: Sets the alarm threshold of alarm indication signal (AIS), which can be **level-1** and **level-2**.

- The **level-1** keyword specifies generating an AIS alarm when the number of 0s in the bit stream of an SF or ESF frame is less than or equal to 2.
- The **level-2** keyword specifies generating an AIS alarm when the number of 0s is less than or equal to 3 in the bit stream of an SF frame or less than or equal to 5 in the bit stream of an ESP frame.

lfa: Sets the loss of frame alignment (LFA) alarm threshold, which can be **level-1**, **level-2**, **level-3**, and **level-4**.

- The **level-1** keyword specifies generating an LFA alarm when two of four frame alignment bits are lost.
- The **level-2** keyword specifies generating an LFA alarm when two of five frame alignment bits are lost.
- The **level-3** keyword specifies generating an LFA alarm when two of six frame alignment bits are lost.
- The **level-4** keyword applies only to ESF frames. It specifies generating an LFA alarm when errors are detected in four consecutive ESF frames.

los: Sets a loss of signal (LOS) alarm threshold, which can be **pulse-detection** (for the pulse detection duration threshold with LOS) and **pulse-recovery** (for the pulse threshold with LOS).

The threshold of pulse-detection in the range of 16 to 4096, in units of pulse intervals.

The threshold of pulse-recovery is in the range of 1 to 256.

If the number of the pulses detected during the total length of the specified pulse detection intervals is smaller than the pulse-recovery threshold, a LOS alarm occurs. For example, if the two thresholds take their defaults, a LOS alarm is created if the number of pulses detected within 176 pulse intervals is less than 22.

Examples

Set the number of detection intervals to 300 for the pulse detection duration threshold.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] ft1 alarm-threshold los pulse-detection 300
```

Related commands

ft1 frame-format

ft1 bert

Use **ft1 bert** to start a BERT test on a T1-F interface.

Use **undo ft1 bert** to stop the BERT test running on the T1-F interface.

Syntax

ft1 bert pattern { **2^20** | **2^15** } **time** *minutes* [**unframed**]

undo ft1 bert

Default

No BERT test is performed.

Views

T1-F interface view

Predefined user roles

network-admin

Parameters

pattern: Sets a bit error rate test (BERT) pattern, which could be 2^15 or 2^20.

2^15: Specifies the length of transmitted BERT pattern, in bits, as two to the fifteenth power.

2^20: Specifies the length of transmitted BERT pattern, in bits, as two to the twentieth power.

time *minutes*: Sets the duration (in minutes) of a BERT test. The *minute* argument is up to 1,440.

unframed: Sets the test pattern to cover the overhead bits of the frame.

Usage guidelines

ITU O.151, ITU O.153, and ANSI T1.403-1999 define many BERT patterns, among which, the T1-F interface supports only 2^15 and 2^20.

When running a BERT test, the local end sends out a pattern, which is to be looped somewhere on the line and sent back to the local end. The local end then checks the received pattern for bit error rate to help you identify the condition of the line. You must configure loopback to allow the transmitted pattern to loop back from somewhere on the line, for example, from the far-end interface by placing the interface in a far-end loopback.

Examples

Run a 10-minute 2^20 BERT test on T1-F interface Serial 2/0.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] ft1 bert pattern 2^20 time 10
```

Related commands

display ft1

ft1 cable

Use **ft1 cable** to set the cable attenuation and length on a T1-F interface.

Use **undo ft1cable** to restore the default.

Syntax

ft1 cable { **long** *decibel* | **short** *length* }

undo ft1 cable

Default

The cable attenuation length is **long 0db**.

Views

T1-F interface view

Predefined user roles

network-admin

Parameters

long *decibel*: Matches 199.6-meter (655-feet) and longer cable length. The argument *decibel* can take **0db**, **-7.5db**, **-15db**, or **-22.5db**, depending on the signal quality at the receiving end. No external CSU is required.

short *length*: Matches a cable length shorter than 199.6 meters (655 feet). The argument *length* can take **133ft**, **266ft**, **399ft**, **533ft**, or **655ft**, depending on the actual transmission distance.

Usage guidelines

You can use this command to adapt the signal waveform to different transmission conditions such as the quality of the signal received by the receiver. If signal quality is good, use the default setting.

Examples

Set the cable length to 133 feet (40.5 meters) on T1-F interface Serial 2/0.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] ft1 cable short 133ft
```

Related commands

ft1 frame-format

ft1 clock

Use **ft1 clock** to configure the clock source for the T1-F interface.

Use **undo ft1 clock** to restore the default.

Syntax

ft1 clock { **master** | **slave** }

undo ft1 clock

Default

The clock source for the T1-F interface is line clock (slave).

Views

T1-F interface view

Predefined user roles

network-admin

Parameters

master: Adopts the internal clock as the clock source.

slave: Adopts the line clock as the clock source.

Usage guidelines

When the T1-F interface is operating as a DCE, choose the internal clock for it. When it is operating as a DTE, choose the line clock for it.

When the T1-F interfaces on two routers are directly connected, one interface must operate in master clock mode to provide the clock source and the other in slave clock mode to accept.

When the T1-F interface on your router is connected to a switch, it is operating as a DTE and therefore must be configured with the slave clock mode to accept the line clock provided by the switch operating as a DCE.

Examples

Use the internal clock as the clock source on T1-F interface Serial 2/0.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] ft1 clock master
```

ft1 code

Use **ft1 code** to set the line code format for the T1-F interface.

Use **undo ft1 code** to restore the default.

Syntax

ft1 code { **ami** | **b8zs** }

undo ft1 code

Default

The line code format for the T1-F interface is B8ZS.

Views

T1-F interface view

Predefined user roles

network-admin

Parameters

ami: Adopts AMI line code format.

b8zs: Adopts B8ZS line code format.

Usage guidelines

Keep the line code format of the interface in consistency with the one used on the remote device.

To ensure the normal operation of the interface, configure the **ft1 data-coding inverted** command on it when its line code format is set to AMI.

Examples

Set the line code format of T1-F interface Serial 2/0 to AMI.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] ft1 code ami
```

Related commands

ft1 data-coding

ft1 data-coding

Use **ft1 data-coding** to enable or disable user data inversion for a T1-F interface.

Use **undo ft1 data-coding** to restore the default.

Syntax

ft1 data-coding { **inverted** | **normal** }

undo ft1 data-coding

Default

Data inversion is disabled.

Views

T1-F interface view

Predefined user roles

network-admin

Parameters

inverted: Enables user data inversion.

normal: Disables user data inversion.

Usage guidelines

To prevent 7e in valid data from being taken for stuffing characters, HDLC inserts a zero after every five ones in the data stream. Then, HDLC inverts every one bit into a zero and every zero bit into a one. This ensures that at least at least one out of every eight bits is a one. When AMI encoding is adopted on a T1-F interface, the use of data inversion can eliminate the presence of multiple consecutive zeros.

At the two ends of a T1-F line, the same data inversion setting must be adopted.

Examples

Enable user data inversion on T1-F interface Serial 2/0.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] ft1 data-coding inverted
```

Related commands

ft1 code

ft1 fdl

Use **ft1 fdl** to set the behavior of the T1-F interface on the FDL in ESF framing.

Use **undo ft1 fdl** to restore the default.

Syntax

ft1 fdl { **ansi** | **att** | **both** | **none** }

undo ft1 fdl

Default

FDL is disabled.

Views

T1-F interface view

Predefined user roles

network-admin

Parameters

ansi: Adopts ANSI T1.403 for FDL.

att: Adopts AT&T TR 54016 for FDL.

both: Adopts both ANSI T1.403 and AT&T TR 54016 for FDL.

none: Disables FDL.

Usage guidelines

FDL is an embedded 4 kbps overhead channel within the ESF format for transmitting performance statistics or loopback code.

You can change the setting depending on the setting at the far end.

Examples

Set ANSI FDL on T1-F interface Serial 2/0.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] ft1 fdl ansi
```

Related commands

ft1 frame-format

ft1 frame-format

Use **ft1 frame-format** to set the framing format on the T1-F interface.

Use **undo ft1 frame-format** to restore the default.

Syntax

ft1 frame-format { **esf** | **sf** }

undo ft1 frame-format

Default

The framing format on the T1-F interface is **esf**.

Views

T1-F interface view

Predefined user roles

network-admin

Parameters

esf: Sets the framing format on the T1-F interface to ESF.

sf: Sets the framing format on the T1-F interface to SF.

Usage guidelines

T1-F interfaces support two framing formats, SF and ESF. In SF format, multiple frames can share the same FSC and signaling information, so that more significant bits are available for transmitting user data. The use of ESF allows you to test the system without affecting the ongoing service.

Examples

Set the framing format of T1-F interface Serial 2/0 to SF.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] ft1 frame-format sf
```

Related commands

ft1 fdl

ft1 idle-code

Use **ft1 idle-code** to set the line idle code on the T1-F interface. Two types of line idle code are available: 0x7E and 0xFF.

Use **undo ft1 idle-code** to restore the default.

Syntax

ft1 idle-code { **7e** | **ff** }

undo ft1 idle-code

Default

The line idle code on the T1-F interface is 0x7E.

Views

T1-F interface view

Predefined user roles

network-admin

Parameters

7e: Sets the line idle code to 0x7E.

ff: Sets the line idle code to 0xFF.

Usage guidelines

The line idle code is sent in the timeslots that are not bundled into the logical channels on the interface.

Examples

Set the line idle code to 0x7E on T1-F interface Serial 2/0.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] ft1 idlecode 7e
```

ft1 itf

Use **ft1 itf** to set the type and the number of interframe filling tags on a T1-F interface. Two types of interframe filling tag are available: 0x7E and 0xFF.

Use **undo ft1 itf** to restore the default.

Syntax

ft1 itf { **number** *number* | **type** { **7e** | **ff** } }

undo ft1 itf { **number** | **type** }

Default

The interframe filling tag is 0x7E, and the number of interframe filling tags is 4.

Views

T1-F interface view

Predefined user roles

network-admin

Parameters

number *number*: Sets the number of interframe filling tags (a interframe filling tag is one byte in length), in the range of 0 to 14.

type { **7e** | **ff** }: Sets the interframe filling tag to 0x7E by specifying the **7e** keyword or to 0xFF by specifying the **ff** keyword. On a T1-F interface, the default interframe filling tag is 0x7E.

Usage guidelines

Interframe filling tags are sent when no service data is sent on the timeslots bundled into logical channels on a T1-F interface.

Do not use the **ft1 itf type ff** command if both the **ft1 code ami** command and the **ft1 data-coding inverted** command are configured so that the T1-F interface can operate properly.

Examples

Set the interframe filling tag to 0xFF on T1-F interface Serial 2/0.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] ft1 itf type ff
```

Set the number of interframe filling tags to 5 on T1-F interface Serial 2/0.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] ft1 itf number 5
```

Related commands

- **ft1 code**
- **ft1 data-coding**

ft1 loopback

Use **ft1 loopback** to set the T1-F interface in a loopback mode.

Use **undo ft1 loopback** to restore the default.

Syntax

ft1 loopback { **local** | **payload** | **remote** }

undo ft1 loopback

Default

Loopback is disabled.

Views

T1-F interface view

Predefined user roles

network-admin

Parameters

local: Sets the interface in internal loopback mode.

payload: Sets the interface in external payload loopback mode.

remote: Sets the interface in external loopback mode.

Usage guidelines

Loopback is mainly used to check the condition of interfaces or cables. Disable loopback in other cases.

The three loopback modes cannot be used simultaneously on a T1-F interface.

Examples

Set T1-F interface Serial 2/0 in local loopback mode.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] ft1 loopback local
```

ft1 sendloopcode

Use **ft1 sendloopcode** to send remote loopback control code.

Syntax

ft1 sendloopcode { **fdl-ansi-llb-down** | **fdl-ansi-llb-up** | **fdl-ansi-plb-down** | **fdl-ansi-plb-up** | **fdl-att-plb-down** | **fdl-att-plb-up** | **inband-llb-down** | **inband-llb-up** }

Default

No remote loopback control code is sent.

Views

T1-F interface view

Predefined user roles

network-admin

Parameters

fdl-ansi-llb-down: Sends ANSI-compliant LLB deactivation request code in the FDL to removes loopback.

fdl-ansi-llb-up: Sends ANSI-compliant line loopback (LLB) activation request code in the FDL to start remote loopback.

fdl-ansi-plb-down: Sends ANSI-compliant PLB deactivation request code in the FDL to remove loopback.

fdl-ansi-plb-up: Sends ANSI-compliant payload loopback (PLB) activation request code in the FDL to start remote loopback.

fdl-att-plb-down: Sends AT&T-complaint PLB deactivation request code in the FDL to remove loopback.

fdl-att-plb-up: Sends AT&T-complaint PLB activation request code in the FDL to start remote loopback.

inband-llb-down: Sends in-band LLB deactivation request code compliant with the ANSI or AT&T implementation to remove loopback.

inband-llb-up: Sends in-band line loopback (LLB) activation request code compliant with the ANSI or AT&T implementation to start remote loopback.

Usage guidelines

You can configure loopback on the remote T1-F interface by sending loopback request code.

In LLB mode, all 193 bits (one synchronization bit and 192 effective bandwidth bits) in a T1 PCM frame are looped back. In PLB mode, however, only 192 effective bandwidth bits are looped back.

The format of loopback code is compliant with ANSI T1.403 or AT&T TR 54016.

In SF framing, LLB code is sent using the effective bandwidth (slots 1 through 24). In ESF framing, both LLB code and PLB code are sent/received in the FDL in ESF frames.

You can use this command only when the remote T1-F interface can automatically detect loopback request code from the network.

Examples

Send in-band LLB activation request code.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] ft1 sendloopcode inband-llb-up
```

Related commands

ft1 frame-format

ft1 timeslot-list

Use **ft1 timeslot-list** to bundle timeslots on a T1-F interface.

Use **undo ft1 timeslot-list** to restore the default.

Syntax

ft1 timeslot-list *list* [**speed** { **56k** | **64k** }]

undo ft1 timeslot-list

Default

All the timeslots on the T1-F interface are bundled to form a 1536 kbps interface.

Views

T1-F interface view

Predefined user roles

network-admin

Parameters

list: Specifies timeslots to be bundled. They are numbered 1 through 24. You can specify a single timeslot by specifying its number, a range of timeslots by specifying a range in the form of *number1*-*number2*, or several discrete timeslots by specifying *number1*, *number2*-*number3*.

speed { **56k** | **64k** }: Time slot bundling speed in kbps. If **56k** applies, timeslots are bundled into an N × 56 kbps bundle. If **64k** (the default) applies, timeslots are bundled into an N × 64 kbps bundle.

Usage guidelines

Timeslot bundling results in interface rate change. For example, after you bundle timeslots 1 through 10 on the interface, the interface rate becomes 10 × 64 kbps or 10 × 56 kbps.

Only one channel set can be created on a T1-F interface, and this channel set is associated with the current synchronous serial interface. On a CT1/PRI interface, you can create multiple channel sets; for each of them, the system automatically creates a synchronous serial interface.

Examples

Bundle timeslots 1, 2, 5, 10 through 15, and 18 on T1-F interface Serial 2/0.

```
<Sysname> system-view
[Sysname] interface serial 2/0
```

```
[Sysname-Serial2/0] ft1 timeslot-list 1,2,5,10-15,18
```

mtu

Use **mtu** to set the MTU of a T1-F interface.

Use **undo mtu** to restore the default.

Syntax

mtu *size*

undo mtu

Default

The MTU of a T1-F interface is 1500 bytes.

Views

T1-F interface view

Predefined user roles

network-admin

Parameters

size: MTU of the current interface, in the range of 128 to 1650 bytes.

Usage guidelines

The MTU setting can affect IP packets assembly and fragmentation on the interface.

To validate your MTU setting, shut down and then bring up the interface with the **shutdown** and **undo shutdown** commands.

Examples

Set the MTU of the T1-F interface Serial 2/0 to 1430 bytes.

```
<Sysname> system-view
[Sysname] interface serial 2/0
[Sysname-Serial2/0] mtu 1430
```

reset counters interface

Use **reset counters interface** to clear statistics on the specified interface.

Syntax

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

Views

User view

Predefined user roles

network-admin

Parameters

serial *interface-number*: Specifies a serial interface by its number.

Usage guidelines

When you collect traffic statistics for a specific period of time on a BRI interface, clear the existing statistics on the interface.

- If you do not specify the **serial** keyword, this command clears statistics on all interfaces.
- If you specify the **serial** keyword without the *interface-number* argument, this command clears statistics on all serial interfaces.
- If you specify both the **serial** keyword and the *interface-number* argument, this command clears statistics on a specified serial interface.

Examples

Clear statistics on interface Serial 2/0.

```
<Sysname> reset counters interface serial 1/0
```

CE3 interface configuration commands

The following matrix shows the command and router compatibility:

Command	MSR2000	MSR3000	MSR4000
CE3 interface configuration commands	No	Yes	Yes

bert

Use **bert** to enable BERT test.

Use **undo bert** to disable BERT test.

Syntax

bert pattern { **2^7** | **2^11** | **2^15** | **qrss** } **time** *number* [**unframed**]

undo bert

Default

No BERT test is performed.

Views

CE3 interface view

Predefined user roles

network-admin

Parameters

pattern: Specifies BERT test mode, which can be 2^7, 2^11, 2^15, and QRSS.

2^7: Specifies the code stream transmitted is the 7th power of 2 bits in length.

2^11: Specifies the code stream transmitted is the 11th power of 2 bits in length.

2^15: Specifies the code stream transmitted is the 15th power of 2 bits in length.

qrss: Specifies the code stream transmitted is the 20th power of 2 bits in length and the number of successive 0s in the code stream is no more than 14.

time *number*: Sets the duration (in minutes) of a BERT teat. The *number* argument is in the range of 1 to 1,440.

unframed: Sets the overhead bits of the padding frames for BERT test.

Usage guidelines

Multiple BERT test modes exist, as defined in ITU O.151, ITU O.153, and ANSI T1.403-1999. 2^7, 2^11, 2^15, and QRSS are available on a CE3 interface.

To perform a BERT test, the local end transmits test data stream, which is returned after reaching specific nodes. The local end then checks for the bit error rate by comparing the returned data stream with the original, through which the state of the link can be determined. BERT test requires that data stream can be looped back on specific nodes. You can achieve this by enabling remote loop back on the peer.

You can use the **bert** command to set the test mode and the test duration. During the process of a BERT test, you can check the state and the result of the test. For more information, see the command that displays information about a CE3 interface.

Examples

Perform BERT test in QRSS mode on CE3 2/0 interface, setting the duration to 10 minutes.

```
<Sysname> system-view
[Sysname] controller e3 2/0
[Sysname-E3 2/0] bert pattern qrss time 10
```

clock

Use **clock** to configure the clock source for a CE3 interface.

Use **undo clock** to restore the default.

Syntax

clock { **master** | **slave** }

undo clock

Default

The clock source for a CE3 interface is line clock (slave).

Views

CE3 interface view

Predefined user roles

network-admin

Parameters

master: Adopts the internal clock as the clock source.

slave: Adopts the line clock as the clock source.

Usage guidelines

The clock source is selected depending on the connected remote device. If connected to a transmission device, the local end uses the line clock. If connected to a CE3 interface on another router, the local end can use whichever clock so long as it is different from the one adopted at the remote end.

Examples

Use the internal clock as the clock source on CE3 interface E3 2/0.

```
<Sysname> system-view
[Sysname] controller e3 2/0
[Sysname-E3 2/0] clock master
```

controller e3

Use **controller e3** to enter CE3 interface view.

Syntax

controller e3 *interface-number*

Views

System view

Predefined user roles

network-admin

Parameters

interface-number: Specifies a CE3 interface by its number.

Examples

Enter the view of interface E3 2/0.

```
<Sysname> system-view
[Sysname] controller e3 2/0
[Sysname-E3 2/0]
```

display controller e3

Use **display controller e3** to display information about CE3 interfaces.

Syntax

display controller e3 [*interface-number*]

Views

Any view

Predefined user roles

network-admin

network-operator

Parameters

interface-number: Specifies a CE3 interface by its number. If you do not specify this argument, the command displays information about all CE3 interfaces.

Usage guidelines

This command also displays information about each E1 line on the CE3 interface if the interface is operating in CE3 mode.

Examples

Display information about interface E3 2/0.

```
<Sysname> display controller e3 2/0
E3 2/0
Current state: UP
Description: E3 2/0 Interface
Frame-format: G751, line code: HDB3, clock: slave
national-bit: 1, Current mode: CE3, loopback: not set, Alarm: none
ERROR: 2 BPV, 0 EXZ, 0 FrmErr, 0 FEBE
BERT state: (stopped, not completed)
  Test pattern: 2^7, Status: Not Sync, Sync Detected: 0
    Time: 2 minutes Time past: 2 minutes
    Bit errors (since test started): 0 bits
    Bits received (since test started): 0 Mbits
    Bit errors (since latest sync): 0 bits
    Bits received (since latest sync): 0 Mbits
E3 2/0  CE1 1: up
  Frame-format: NO-CRC4, clock: slave, loopback: not set
  Receiver alarm state: none
  BERT state: (stopped, not completed)
E3 2/0  CE1 2: up
  Frame-format: NO-CRC4, clock: slave, loopback: not set
  Receiver alarm state: none
  BERT state: (stopped, not completed)
E3 2/0  CE1 3: up
  Frame-format: NO-CRC4, clock: slave, loopback: not set
  Receiver alarm state: none
  BERT state: (stopped, not completed)
E3 2/0  CE1 4: up
  Frame-format: NO-CRC4, clock: slave, loopback: not set
  Receiver alarm state: none
  BERT state: (stopped, not completed)
E3 2/0  CE1 5: up
  Frame-format: NO-CRC4, clock: slave, loopback: not set
  Receiver alarm state: none
  BERT state: (stopped, not completed)
E3 2/0  CE1 6: up
  Frame-format: NO-CRC4, clock: slave, loopback: not set
  Receiver alarm state: none
  BERT state: (stopped, not completed)
E3 2/0  CE1 7: up
  Frame-format: NO-CRC4, clock: slave, loopback: not set
  Receiver alarm state: none
  BERT state: (stopped, not completed)
E3 2/0  CE1 8: up
  Frame-format: NO-CRC4, clock: slave, loopback: not set
  Receiver alarm state: none
  BERT state: (stopped, not completed)
```

```
E3 2/0  CE1 9: up
  Frame-format: NO-CRC4, clock: slave, loopback: not set
  Receiver alarm state: none
  BERT state: (stopped, not completed)
E3 2/0  CE1 10: up
  Frame-format: NO-CRC4, clock: slave, loopback: not set
  Receiver alarm state: none
  BERT state: (stopped, not completed)
E3 2/0  CE1 11: up
  Frame-format: NO-CRC4, clock: slave, loopback: not set
  Receiver alarm state: none
  BERT state: (stopped, not completed)
E3 2/0  CE1 12: up
  Frame-format: NO-CRC4, clock: slave, loopback: not set
  Receiver alarm state: none
  BERT state: (stopped, not completed)
E3 2/0  CE1 13: up
  Frame-format: NO-CRC4, clock: slave, loopback: not set
  Receiver alarm state: none
  BERT state: (stopped, not completed)
E3 2/0  CE1 14: up
  Frame-format: NO-CRC4, clock: slave, loopback: not set
  Receiver alarm state: none
  BERT state: (stopped, not completed)
E3 2/0  CE1 15: up
  Frame-format: NO-CRC4, clock: slave, loopback: not set
  Receiver alarm state: none
  BERT state: (stopped, not completed)
E3 2/0  CE1 16: up
  Frame-format: NO-CRC4, clock: slave, loopback: not set
  Receiver alarm state: none
  BERT state: (stopped, not completed)
```

Table 18 Command output

Field	Description
E3 2/0 Current state	Physical state of the interface: up or down.
Description	Description about the E3 interface.
Frame-format	Frame format configured on the E3 interface: CRC4 or NO CRC4.
Line Code	Line code: AMI or B8ZS.
clock	Source clock used by the interface: master for the internal clock or slave for the line clock.
National-bit	International bit.
Current mode	Operating mode of the E3 interface: E3 or CE3.
Loopback	Loopback setting on the interface.

Field	Description
Alarm	Alarm state.
BERT state	BERT state: completed, stopped (not completed), or running.
Test pattern	Test pattern in use: 2^20 or 2^15.
Status	Whether is being synchronized.
Sync Detected	Number of detected synchronizations.
Time	Duration of the BERT test.
Time past	Time that has elapsed.
Bit Errors (since test started)	Number of bit errors received since start of the BERT test.
Bits Received (since test started)	Number of bits received since start of the BERT test.
Bit Errors (since latest sync)	Number of bit errors received since last synchronization.
Bits Received (since latest sync)	Number of bits received since last synchronization.
E3 2/0 CE1 1	Physical state of the E1 channel: up or down.
Frame-format	Frame format configured on the E1 channel: ESF or SF.
clock	Source clock used by the E1 channel: master for the internal clock or slave for the line clock.
loopback	Loopback setting on the E1 channel.
Receiver alarm state	Alarm state of received by the E1 channel, LOS, LOF, AIS, or RAI.
BERT state	BERT state: completed, stopped (not completed), or running.

Related commands

reset counters controller e3

e1 bert

Use **e1 bert** to enable BERT test for an E1 channel created on a CE3 interface.

Use **undo e1 bert** to disable BERT test.

Syntax

e1 *line-number* **bert pattern** { **2^11** | **2^15** | **2^20** | **2^23** | **qrss** } **time** *number* [**unframed**]

undo e1 *line-number* **bert**

Default

No BERT test is performed.

Views

CE3 interface view

Predefined user roles

network-admin

Parameters

line-number: E1 channel number in the range of 1 to 16.

pattern: Specifies BERT test mode, which can be 2^11, 2^15, 2^20, 2^23, and QRSS.

2^11: Specifies the code stream transmitted is the 11th power of 2 bits in length.

2^15: Specifies the code stream transmitted is the 15th power of 2 bits in length.

2^20: Specifies the code stream transmitted is the 20th power of 2 bits in length.

2^23: Specifies the code stream transmitted is the 23rd power of 2 bits in length.

qrss: Specifies the code stream transmitted is the 20th power of 2 bits in length and the number of successive 0s in the code stream is no more than 14.

time *number*: Sets the duration (in minutes) of a BERT test. The *number* argument is in the range of 1 to 1,440.

unframed: Sets the overhead bits of the padding frames for BERT test.

Usage guidelines

Multiple BERT test modes exist, as defined in ITU O.151, ITU O.153, and ANSI T1.403-1999. 2^11, 2^15, 2^20, 2^23, and QRSS are available on E1 channels created on CE3 interfaces.

To perform a BERT test, the local end transmits test data stream, which is returned after reaching specific nodes. The local end then checks for the bit error rate by comparing the returned data stream with the original, through which the state of the link can be determined. BERT test requires that data stream can be looped back on specific nodes. You can achieve this by enabling remote loop back on the peer.

You can use the **bert** command to set the test mode and the test duration. During the process of a BERT test, you can check the state and the result of the test. For more information, see the command that displays information about a CE3 interface.

Examples

Perform BERT test in QRSS mode on E1 channel 1 created on CE3 2/0 interface, setting the duration to 10 minutes.

```
<Sysname> system-view
[Sysname] interface e3 2/0
[Sysname-E3 2/0] e1 1 bert pattern qrss time 10
```

e1 channel-set

Use **e1 channel-set** to bundle timeslots on an E1 line.

Use **undo e1 channel-set** to remove a timeslot bundle.

Syntax

e1 *line-number* **channel-set** *set-number* **timeslot-list** *list*

undo e1 *line-number* **channel-set** *set-number*

Default

No timeslots are bundled into channel sets.

Views

CE3 interface view

Predefined user roles

network-admin

Parameters

line-number: E1 line number in the range of 1 to 16.

set-number: Number of the channel set formed by a timeslot bundle on the E1 line, in the range of 0 to 30.

timeslot-list *list*: Specifies the timeslots to be bundled. The *list* argument can contain multiple timeslot numbers, each of which is in the range of 1 to 31. You can specify a single timeslot by specifying a timeslot number, a range of timeslots by providing this argument in the form of { *number1*-*number2* }, or multiple timeslots by providing this argument in the form of { *number1*, *number2*-*number3* }.

Usage guidelines

A CE3 interface can be channelized into 64 kbps lines and the timeslots on each E1 line can be bundled into up to 31 channels.

When an E1 line operates in framed (CE1) mode, you can bundle timeslots on it into channel sets. For each channel set, the system automatically creates a serial interface numbered **serial** *number*/*line-number*:*set-number*. For example, the serial interface formed by channel set 0 on the first E1 line on E3 1/0 is numbered 1/0/1:0. This interface can operate at N × 64 kbps, and is logically equivalent to a synchronous serial interface on which you can make other configurations.

Examples

Create a 128 kbps serial interface on the first E1 channel on interface E3 2/0.

```
<Sysname> system-view
[Sysname] controller e3 2/0
[Sysname-E3 2/0] e1 1 channel-set 1 timeslot-list 1,2
```

Related commands

e1 unframed

e1 clock

Use **e1 clock** to configure clock source for an E1 line on the CE3 interface.

Use **undo e1 clock** to restore the default.

Syntax

e1 *line-number* **clock** { **master** | **slave** }

undo e1 *line-number* **clock**

Default

The clock source for an E1 line on the CE3 interface is line clock (slave).

Views

CE3 interface view

Predefined user roles

network-admin

Parameters

line-number: E1 line number in the range of 1 to 16.

master: Adopts the internal clock as the clock source.

slave: Adopts the line clock as the clock source.

Usage guidelines

When the CE3 interface is operating in channelized mode, you can set separate clock for each E1 line on it.

Examples

Use the internal clock as the clock source on the first E1 line on interface E3 2/0.

```
<Sysname> system-view
[Sysname] controller e3 2/0
[Sysname-E3 2/0] e1 1 clock slave
```

e1 frame-format

Use **e1 frame-format** to set framing format for an E1 line.

Use **undo e1 frame-format** to restore the default.

Syntax

e1 *line-number* **frame-format** { **crc4** | **no-crc4** }

undo e1 *line-number* **frame-format**

Default

The framing format for an E1 line is no-CRC4.

Views

CE3 interface view

Predefined user roles

network-admin

Parameters

line-number: E1 line number in the range of 1 to 16.

crc4: Sets the frame format to CRC4.

no-crc4: Sets the frame format to no-CRC4.

Usage guidelines

Configure this command only when the specified E1 line is operating in framed format (which can be set using the **undo e1 unframed** command).

Examples

Set the framing format to CRC4 for the first E1 line on interface E3 2/0.

```
<Sysname> system-view
[Sysname] controller e3 2/0
[Sysname-E3 2/0] e1 1 frame-format crc4
```

Related commands

e1 unframed

e1 loopback

Use **e1 loopback** to set an E1 line in a loopback mode on the E3 interface.

Use **undo e1 loopback** to restore the default.

Syntax

e1 *line-number* **loopback** { **local** | **payload** | **remote** }

undo e1 *line-number* **loopback**

Default

Loopback is disabled on E1 lines.

Views

CE3 interface view

Predefined user roles

network-admin

Parameters

line-number: E1 line number in the range of 1 to 16.

local: Sets the E1 line in internal loopback mode.

payload: Sets the E1 line in payload loopback mode.

remote: Sets the E1 line in external loopback mode.

Usage guidelines

If an E1 line encapsulated with PPP is in loopback mode, the state of the link layer protocol is reported down.

Examples

Set the first E1 line on interface E3 2/0 in internal loopback mode.

```
<Sysname> system-view
[Sysname] controller e3 2/0
[Sysname-E3 2/0] e1 1 loopback local
```

e1 shutdown

Use **e1 shutdown** to shut down an E1 line on the CE3 interface.

Use **undo e1 shutdown** to restore the default.

Syntax

e1 *line-number* **shutdown**

undo e1 *line-number* **shutdown**

Default

E1 lines are up.

Views

CE3 interface view

Predefined user roles

network-admin

Parameters

line-number: E1 line number in the range of 1 to 16.

Usage guidelines

This command affects not only the specified E1 line but also the serial interfaces formed by E1 line bundling. Performing the **e1 shutdown** command on the specified E1 line shuts down all these serial interfaces. Data transmission and receiving stop as a result. Likewise, performing the **undo e1 shutdown** command restarts all these serial interfaces.

Examples

Shut down the first E1 line on interface E3 2/0.

```
<Sysname> system-view
[Sysname] controller e3 2/0
[Sysname-E3 2/0] e1 1 shutdown
```

e1 unframed

Use **e1 unframed** to set an E1 line on the CE3 interface to operate in unframed mode (E1 mode).

Use **undo e1 unframed** to restore the default.

Syntax

e1 *line-number* **unframed**

undo e1 *line-number* **unframed**

Default

An E1 line operates in framed mode (CE1 mode).

Views

CE3 interface view

Predefined user roles

network-admin

Parameters

line-number: E1 line number in the range of 1 to 16.

Usage guidelines

An E1 line in unframed mode does not contain the frame control information; it cannot be divided into timeslots. The system automatically creates a serial interface numbered **serial** *number*/*line-number***:0** for it. This interface operates at 2048 kbps and is logically equivalent to a synchronous serial interface on which you can make other configurations.

Examples

Set the first E1 line on interface E3 2/0 to operate in unframed mode.

```
<Sysname> system-view
```

```
[Sysname] controller e3 2/0
[Sysname-E3 2/0] e1 1 unframed
```

Related commands

e1 channel-set

fe3

Use **fe3** to configure a CE3 interface to operate in FE3 mode and set the DSU mode or the subrate.

Use **undo fe3** to restore the default.

Syntax

fe3 { **dsu-mode** { **0** | **1** } | **subrate** *number* }

undo fe3 { **dsu-mode** | **subrate** }

Default

DSU mode 1 (the Kentrox mode) is adopted, and the subrate is 34010 kbps.

Views

CE3 interface (in FE3 mode) view

Predefined user roles

network-admin

Parameters

dsu-mode: Specifies the FE3 (Fractional E3) DSU mode for a CE3 interface operating in FE3 mode. This keyword can be followed by **0** or **1**.

0: Specifies the Digital Link mode, where the subrate is a multiple of 358 kbps and is in the range of 358 to 34010 kbps (up to 95 rate levels are available).

1: Specifies the Kentrox mode, where the subrate is a multiple of 500 kbps and is in the range of 500 to 24500 kbps. In this mode, the subrate can also be 34010 kbps (making a total of 50 rate levels).

subrate *number*: Specifies the subrate for the CE3 interface. The *number* argument is in the range of 1 to 34010 (in kbps).

Usage guidelines

FE3 mode is a non-standard E3 application mode. In this mode, the subrate level setting varies with vendors. You can use the **fe3** command to make the device to be compatible with devices of other vendors operating in specific FE3 DSU modes.

This command is only applicable to CE3 boards that support FE3.

This command is available only in E3 mode.

As for the **fe3 subrate** command, the actual subrate usually is not exactly the one set by the command. After you set the subrate by using the **fe3 subrate** command, the CE3 interface searches the subrate levels corresponding to the DSU mode it is operating in and selects the one that is closest to that set by the command as its subrate. The device then adjusts the hardware to allow for the subrate.

You can use the **display interface serial interface-number:0** command to check the DSU mode setting, the subrate, the actual rate, and the baudrate of a CE3 interface. The actual rate does not include the overhead bits, and the baudrate is the actual E3 line rate (34368 kbps), with the overhead bits counted in.

Examples

Configure E3 2/0 interface to operate in the FE3 mode, setting the DSU mode to 1 and the subrate to 3000 kbps.

```
<Sysname> system-view
[Sysname] controller e3 2/0
[Sysname-E3 2/0] using e3
[Sysname-E3 2/0] fe3 dsu-mode 1
[Sysname-E3 2/0] fe3 subrate 3000
```

loopback

Use **loopback** to configure the loopback mode of the CE3 interface.

Use **undo loopback** to restore the default.

Syntax

loopback { **local** | **payload** | **remote** }

undo loopback

Default

Loopback is disabled on the CE3 interface.

Views

CE3 interface view

Predefined user roles

network-admin

Parameters

local: Enables internal loopback on the CE3 interface.

payload: Enables external payload loopback on the CE3 interface.

remote: Enables external loopback on the CE3 interface.

Usage guidelines

Loopback is intended for test use. Disable loopback in other cases.

If a CE3 interface encapsulated with PPP is placed in a loopback, the state of the link layer protocol is reported as down.

Examples

Enable internal loopback on interface E3 2/0.

```
<Sysname> system-view
[Sysname] controller e3 2/0
[Sysname-E3 2/0] loopback local
```

national-bit

Use **national-bit** to configure the national bit on the CE3 interface.

Use **undo national-bit** to restore the default.

Syntax

national-bit { **0** | **1** }

undo national-bit

Default

The national bit on the CE3 interface is 1.

Views

CE3 interface view

Predefined user roles

network-admin

Parameters

0: Sets the national bit to 0 for national communication.

1: Sets the national bit to 1 for international communication.

Usage guidelines

You need to set the national bit to 0 on an E3 interface only in some special circumstances.

Examples

Set the national bit to 0 on interface E3 2/0.

```
<Sysname> system-view
[Sysname] controller e3 2/0
[Sysname-E3 2/0] national-bit 0
```

reset counters controller e3

Use **reset counters controller e3** to clear the controller counter of a CE3 interface.

Syntax

reset counters controller e3 *interface-number*

Views

User view

Predefined user roles

network-admin

Parameters

interface-number: Specifies a CE3 interface by its number. If you do not specify this argument, the command clears the counters of all CE3 interfaces.

Usage guidelines

The **reset counters interface** command clears the counters of all interfaces. To clear the controller counter of individual CE3 interfaces, use the **reset counters controller e3** command.

Examples

Clear the controller counter of the CE3 interface E3 2/0.

```
<Sysname> reset counters controller e3 2/0
```

Related commands

display controller e3

using

Use **using** to configure the operating mode of the CE3 interface.

Use **undo using** to restore the default.

Syntax

using { **ce3** | **e3** }

undo using

Default

A CE3 interface operates in channelized mode.

Views

CE3 interface view

Predefined user roles

network-admin

Parameters

ce3: Sets the CE3 interface to operate in channelized mode.

e3: Sets the CE3 interface to operate in unchannelized mode.

Usage guidelines

You can configure E1 lines only when the CE3 interface is operating in channelized mode.

When the CE3 interface is operating in unchannelized mode, the system automatically creates a serial interface numbered **serial** *number*/**0:0** for it. This interface operates at 34.368 Mbps and is logically equivalent to a synchronous serial interface on which you can make other configurations.

Examples

Configure interface E3 2/0 to operate in unchannelized mode.

```
<Sysname> system-view
[Sysname] controller e3 2/0
[Sysname-E3 2/0] using e3
```

POS interface commands

The following matrix shows the POS interface commands and router compatibility:

Commands	MSR2000	MSR3000	MSR4000
POS interface commands	No	Yes	Yes

bandwidth

Use **bandwidth** to configure the expected bandwidth of an interface.

Use **undo bandwidth** to restore the default.

Syntax

bandwidth *bandwidth-value*

undo bandwidth

Default

The expected bandwidth (in kbps) is the interface baud rate divided by 1000.

Views

POS interface view

Predefined user roles

network-admin

Parameters

bandwidth-value: Specifies the expected bandwidth in the range of 1 to 400000000 kbps.

Usage guidelines

The expected bandwidth of an interface affects the link costs in OSPF, OSPFv3, and IS-IS. For more information, see *Layer 3—IP Routing Configuration Guide*.

Examples

Set the expected bandwidth of interface POS 5/1 to 50 kbps.

```
<Sysname> system-view
[Sysname] interface pos 5/1
[Sysname-Pos5/1] bandwidth 50
```

clock

Use **clock** to set the clock mode of the POS interface.

Use **undo clock** to restore the default.

Syntax

clock { **master** | **slave** }

undo clock

Default

The clock mode is slave.

Views

POS interface view

Predefined user roles

network-admin

Parameters

master: Sets the clock mode of the POS interface to master.

slave: Sets the clock mode of the POS interface to slave.

Usage guidelines

POS interfaces support the following clock modes:

- **Master**—Uses internal clock signal.
- **Slave**—Uses line clock signal.

If the POS interface is connected to another router, set its clock mode to be different from the mode used by the remote end. If the POS interface is connected to a SONET/SDH device, which provides higher clock precision, always set its clock mode to slave.

Examples

Set the clock mode of interface POS 5/1 to master.

```
<Sysname> system-view
[Sysname] interface pos 5/1
[Sysname-Pos5/1] clock master
```

crc

Use **crc** to set the CRC length on the POS interface.

Use **undo crc** to restore the default.

Syntax

crc { **16** | **32** }

undo crc

Default

The CRC length is 32 bits.

Views

POS interface view

Predefined user roles

network-admin

Parameters

16: Sets the cyclic redundancy check (CRC) length to 16 bits.

32: Sets the CRC length to 32 bits.

Usage guidelines

The CRC length must be the same on both ends.

Examples

Set the CRC length on interface Pos 5/1 to 16 bits.

```
<Sysname> system-view
[Sysname] interface pos 5/1
[Sysname-Pos5/1] crc 16
```

default

Use **default** to restore the default settings for the POS interface.

Syntax

default

Views

POS interface view

Predefined user roles

network-admin

Usage guidelines

CAUTION:

The **default** command might interrupt ongoing network services. Make sure you are fully aware of the impacts of this command when you perform it on a live network.

This command might fail to restore the default settings for some commands for reasons such as command dependencies and system restrictions. You can use the **display this** command in interface view to check for these commands, and perform their **undo** forms or follow the command reference to individually restore their default settings. If your restoration attempt still fails, follow the error message to resolve the problem.

Examples

Restore the default settings of POS interface POS 5/1.

```
<Sysname> system-view
[Sysname] interface pos 5/1
[Sysname-Pos5/1] default
```

description

Use **description** to set the description for the POS interface.

Use **undo description** to restore the default.

Syntax

description *text*

undo description

Default

The description of a POS interface is *interface name* Interface, for example, Pos5/0 Interface.

Views

POS interface view

Predefined user roles

network-admin

Parameters

text: Specifies the interface description, a case-sensitive character string of 1 to 255 characters.

Examples

Set the description for POS interface POS 5/1 to pos-interface.

```
<Sysname> system-view
[Sysname] interface pos 5/1
[Sysname-Pos5/1] description pos-interface
```

display interface pos

Use **display interface pos** to display information about POS interfaces.

Syntax

display interface [**pos**] [**brief** [**down**]]

display interface [**pos** [*interface-number*]] [**brief** [**description**]]

Views

Any view

Predefined user roles

network-admin

network-operator

Parameters

interface-number: Displays information about a specified POS interface.

brief: Displays brief interface information. If you do not specify this keyword, the command displays detailed interface information.

down: Displays information about interfaces in the physically DOWN state and the causes. If you do not specify this keyword, this command displays information about interfaces in any state.

description: Displays complete interface descriptions. If you do not specify this keyword, the command displays only the first 27 characters of interface descriptions.

Usage guidelines

If you do not specify the **pos** keyword, this command displays information about all interfaces on the device.

If you specify the **pos** keyword without the *interface-number* argument, this command displays information about all existing POS interfaces.

Examples

Display detailed information about interface POS 5/1.

```
<Sysname> display interface pos 5/1
Pos5/1
Current state: DOWN
Line protocol state: DOWN
Description: Pos5/1 Interface
Bandwidth: 50kbps
Maximum Transmit Unit: 1500
Hold timer: 10 seconds
Internet Address: 5.5.5.2/24 Primary
Link layer protocol: PPP
LCP: opened, IPCP: opened
Physical layer: Packet Over SONET, Baudrate: 155520000 bps
Scramble: enabled, crc: 32, clock: slave, loopback: not set
Output queue - Urgent queuing: Size/Length/Discards 0/100/0
Output queue - Protocol queuing: Size/Length/Discards 0/500/0
Output queue - FIFO queuing: Size/Length/Discards 0/75/0
Last clearing of counters: Never
SONET alarm:
  section layer: OOF LOF LOS
  line    layer: AIS
  path    layer: AIS RDI
  C2(Rx): 0xff, C2(Tx): 0x16
  J0(Rx): unknown
  J0(Tx): ""
  J1(Rx): unknown
  J1(Tx): ""
SONET error:
  section layer: B1 65535
  line    layer: B2 0 M1 0
  path    layer: B3 0 G1 0
Last 300 seconds input rate: 0.00 bytes/sec, 0 bits/sec, 0.00 packets/sec
Last 300 seconds output rate: 0.00 bytes/sec, 0 bits/sec, 0.00 packets/sec
Input:
  0 packets, 0 bytes
  0 errors, 0 runts, 0 giants, 0 CRC
  0 overruns, 0 aborts, 0 no buffers
Output:
  0 packets, 0 bytes
  0 errors, 0 underruns, 0 aborts
```

Display brief information about interface POS 5/1.

```
<Sysname> display interface pos 5/1 brief
Brief information on interface(s) under route mode:
Link: ADM - administratively down; Stby - standby
Protocol: (s) - spoofing
Interface            Link Protocol Main IP         Description
Pos5/1               UP   UP(s)    --
```

Display brief information about all POS interfaces in the physically DOWN state and the causes.

```
<Sysname> display interface pos brief down
Brief information on interface(s) under route mode:
Link: ADM - administratively down; Stby - standby
Interface            Link Cause
Pos5/1               ADM  Administratively
```

Table 19 Command output

Field	Description
Pos5/1 Current state	Current physical and admin state of the POS interface: • **DOWN (Administratively)**—The POS interface has been shut down with the **shutdown** command. • **DOWN**—That the POS interface is physically down because no physical link is present or the link has failed. • **UP**—The POS interface is both administratively and physically up.
Line protocol state	Link layer state of the POS interface: • **UP**—The link layer protocol is up. • **DOWN**—The link layer protocol is down.
Description	Description on the POS interface.
Bandwidth	Expected bandwidth of the interface.
Maximum Transmit Unit	MTU of the POS interface.
Hold timer	Interval at which the link layer protocol sends keepalives.
Link delay	Physical state change suppression interval of the POS interface. Support for this field depends on the device model.
Internet protocol processing	IP protocol processing capability, enabled or disabled.
Link layer protocol is PPP	Link layer protocol of the POS interface and loopback detection state.
LCP: opened, IPCP: opened	Both LCP negotiation and IPCP negotiation succeeded.
Physical layer	Physical interface.
Baudrate	Baudrate of the interface.
Scramble	Payload scrambling state.
crc	CRC count.
clock	Clock mode.
loopback	Loopback state.
SONET alarm	SONET alarms.
SONET error	SONET errors.
Last clearing of counters	Time when the counters were last cleared.

Field	Description
Last 300 seconds input rate: 0 bytes/sec, 0 bits/sec, 0 packets/sec	Input rate in Bps, bps, and pps in the last 300 seconds.
Last 300 seconds output rate: 0 bytes/sec, 0 bits/sec, 0 packets/sec	Output rate in Bps, bps, and pps in the last 300 seconds.
Input: 0 packets, 0 bytes 0 errors, 0 runts, 0 giants, 0 CRC 0 overruns, 0 aborts, 0 no buffers	Count of input traffic in both packets and bytes: • **errors**—Number of inbound packets with errors detected at the physical layer. • **runts**—Number of inbound frames shorter than the minimum frame length. • **giants**—Number of inbound frames larger than the maximum frame length. • **CRC**—Total number of inbound frames that had normal length and contained CRC errors. • **overruns**—Number of frames dropped because the input rate of the port exceeded the forwarding capability. • **aborts**—Total number of illegal inbound frames. • **no buffers**—Number of frames that are dropped because the buffer is used up.
Output: 0 packets, 0 bytes 0 errors, 0 underruns, 0 aborts	Count of output traffic in both packets and bytes: • **errors**—Number of outbound frames with errors detected at the physical layer. • **underruns**—Number of packets dropped because the output rate of the interface exceeded the memory reading rate. • **aborts**—Total number of illegal inbound frames.
Brief information on interface(s) under route mode:	Brief information about Layer 3 interfaces.
Link: ADM - administratively down; Stby - standby	Link status: • **ADM**—The interface has been administratively shut down. To recover its physical state, perform the **undo shutdown** command. • **Stby**—The interface is operating as a backup interface. To see the primary interface, use the **display standby state** command described in *High Availability Command Reference*.
Protocol: (s) - spoofing	If the network layer protocol state of an interface is shown as UP, but its link is an on-demand link or not present at all, its protocol attribute includes the spoofing flag (an **s** in parentheses).
Interface	Abbreviated interface name.
Link	Physical link state of the interface: • **UP**—The link is up. • **ADM**—The link has been administratively shut down. To recover its physical state, perform the **undo shutdown** command.
Protocol	Protocol connection state of the interface, which can be UP, DOWN, or UP(s).

Field	Description
Main IP	Main IP address of the interface.
Description	Description of the interface configured by using the **description** command. If the **description** keyword is not specified in the **display interface brief** command, the Description field displays at most 27 characters. If the **description** keyword is specified in the **display interface brief** command, the field displays the full interface description.
Cause	Causes for the physical state of an interface to be DOWN. • **Administratively**—The port is manually shut down with the **shutdown** command. To restore the physical state of the interface, use the **undo shutdown** command. • **Not connected**—No physical connection exists because the network cable is disconnected or faulty.

Related commands

reset counters interface

flag

Use **flag** to set the SONET/SDH overhead bytes.

Use **undo flag** to restore the default SONET/SDH overhead bytes.

Syntax

flag c2 *flag-value*

undo flag c2

flag { **j0** | **j1** } { **sdh** | **sonet** } *flag-value*

undo flag { **j0** | **j1** } { **sdh** | **sonet** }

Default

The default SDH overhead bytes are used.

The default overhead bytes are as follows:

- **c2**—0x16
- **j0** (SDH)—Null
- **j1** (SDH)—Null
- **j0** (SONET)—0x01
- **j1** (SONET)—Null

Views

POS interface view

Predefined user roles

network-admin

Parameters

c2 *flag-value*: Path signal flag byte, a higher-order path overhead byte used to indicate the multiplex structure of virtual container (VC) frames and property of payload. It is a hexadecimal number in the range of 0x00 to 0xFF.

j0 *flag-value*: Regeneration section trace message, a section overhead byte used to test continuity of the connection between two interfaces at the section level. If the **sdh** keyword is configured, the *flag-value* argument is a string of 1 to 15 hexadecimal digits. If the **sonet** keyword is configured, the argument is a hexadecimal number in the range of 0x00 to 0xFF.

j1 *flag-value*: Path trace message, a higher-order path overhead byte used to test continuity of the connection between two interfaces at the path level. If the **sdh** keyword is configured, the *flag-value* argument is a string of 1 to 15 hexadecimal digits. If the **sonet** keyword is configured, the argument is a string of 1 to 62 characters.

sdh: Sets framing format to SDH.

sonet: Sets framing format to SONET.

Usage guidelines

Inconsistency between the **c2** and **j1** settings of the sending POS interface and the receiving POS interface causes alarms.

The J0 byte can be any character in the network of the same carrier. If two carriers are involved, make sure that the sending and receiving devices use the same J0 byte at their network borders.

Examples

Set the SDH overhead byte J0 of interface POS 5/1.

```
<Sysname> system-view
[Sysname] interface pos 5/1
[Sysname-Pos5/1] flag j0 sdh ff
```

Related commands

- **display interface pos**
- **frame j1 ignore**
- **frame-format**

frame-format

Use **frame-format** to configure framing on the POS interface.

Use **undo frame-format** to restore the default.

Syntax

frame-format { **sdh** | **sonet** }

undo frame-format

Default

The framing format is SDH.

Views

POS interface view

Predefined user roles

network-admin

Parameters

sdh: Sets framing format to synchronous digital hierarchy (SDH).

sonet: Sets framing format to synchronous optical network (SONET).

Usage guidelines

When you use the **flag** command to set the overhead bytes, the settings must match the framing format.

Examples

Set the framing format on interface POS 5/1 to SDH.

```
<Sysname> system-view
[Sysname] interface pos 5/1
[Sysname-Pos5/1] frame-format sdh
```

Related commands

flag

interface pos

Use **interface pos** to enter POS interface view.

Syntax

interface pos *interface-number*

Default

No POS subinterface exists.

Views

System view

Predefined user roles

network-admin

Parameters

interface-number: Specifies a POS interface by its number.

Examples

Enter the view of interface POS 5/1.

```
<Sysname> system-view
[Sysname] interface pos 5/1
[Sysname-Pos5/1]
```

Related commands

link-protocol

link-protocol

Use **link-protocol** to set the link layer protocol of the interface.

Syntax

link-protocol { **hdlc** | **ppp** }

Default

PPP is used.

Views

POS interface view

Predefined user roles

network-admin

Parameters

hdlc: Specifies High-level Data Link Control (HDLC) as the link layer protocol of the interface.

ppp: Specifies the Point-to-Point protocol (PPP) as the link layer protocol of the interface.

Examples

Specify HDLC as the link protocol of interface POS 5/1.

```
<Sysname> system-view
[Sysname] interface pos 5/1
[Sysname-Pos5/1] link-protocol hdlc
```

loopback

Use **loopback** to enable loopback for a POS interface.

Use **undo loopback** to disable loopback.

Syntax

loopback { **local** | **remote** }

undo loopback

Default

Loopback is disabled.

Views

POS interface view

Predefined user roles

network-admin

Parameters

local: Enables internal loopback.

remote: Enables external loopback.

Usage guidelines

Loopback is intended for test use. Disable it otherwise.

If you enable loopback on a POS interface encapsulated with PPP, it is normal that the state of the link layer protocol is reported up.

Loopback and the **clock slave** command cannot be set at the same time; otherwise, POS interfaces cannot be connected successfully.

Examples

Enable internal loopback on interface POS 5/1.

```
<Sysname> system-view
[Sysname] interface pos 5/1
[Sysname-Pos5/1] loopback local
```

Related commands

clock

mtu

Use **mtu** to set the MTU size of the POS interface.

Use **undo mtu** to restore the default.

Syntax

mtu *size*

undo mtu

Default

The MTU of a POS interface is 1500 bytes.

Views

POS interface view

Predefined user roles

network-admin

Parameters

size: Sets the size (in bytes) of the maximum transmission unit (MTU). The value range for this argument is 128 to 1650.

Usage guidelines

The MTU setting of the POS interface can affect the assembly and fragmentation of IP packets.

After configuring the MTU for a POS interface, you must use the **shutdown** command and then the **undo shutdown** command on the interface to make the configuration take effect.

Examples

Set the MTU of POS interface 5/1 to 1430 bytes.

```
<Sysname> system-view
[Sysname] interface pos 5/1
[Sysname-Pos5/1] mtu 1430
```

reset counters interface

Use **reset counters interface** to clear the statistics of the specified or all POS interfaces.

Syntax

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

Views

User view

Predefined user roles

network-admin

Parameters

pos: Clears statistics of POS interfaces.

interface-number: Specifies a POS interface by its number.

Usage guidelines

Before collecting statistics for an interface within a specific period, you need to clear the existing statistics of the interface.

- If you do not specify **pos**, this command clears the statistics of all interfaces.
- If you specify **pos** but not *interface-number*, this command clears the statistics of all POS interfaces.
- If you specify both **pos** and *interface-number*, this command clears the statistics of the specified POS interface.

Examples

Clear the statistics of interface POS 5/1.

```
<Sysname> reset counters interface pos 5/1
```

Related commands

display interface pos

scramble

Use **scramble** to enable payload scrambling on the POS interface.

Use **undo scramble** to disable payload scrambling.

Syntax

scramble

undo scramble

Default

Payload scrambling is enabled on a POS interface.

Views

POS interface view

Predefined user roles

network-admin

Usage guidelines

You can configure payload scrambling to prevent the presence of too many consecutive 1s or 0s, to facilitate line clock signal extraction at the receiving end.

To connect POS interfaces, enable or disable payload scrambling on both ends.

Examples

Enable payload scrambling on interface POS 5/1.

```
<Sysname> system-view
[Sysname] interface pos 5/1
[Sysname-Pos5/1]scramble
```

shutdown

Use **shutdown** to shut down the POS interface.

Use **undo shutdown** to bring up the POS interface.

Syntax

shutdown

undo shutdown

Default

A POS interface is up.

Views

POS interface view

Predefined user roles

network-admin

Examples

Shut down the POS interface POS 5/1.

```
<Sysname> system-view
[Sysname] interface pos 5/1
[Sysname-Pos5/1] shutdown
```

timer-hold

Use **timer-hold** to set the polling interval.

Use **undo timer-hold** to restore the default.

Syntax

timer-hold *seconds*

undo timer-hold

Default

The polling interval is 10 seconds.

Views

POS interface view

Predefined user roles

network-admin

Parameters

seconds: Specifies the interval at which the interface sends keepalive packets. The value range for this argument is 0 to 32767 seconds.

Usage guidelines

The polling interval refers to the interval at which the interface sends keepalive packets.

When the link layer protocol of an interface is PPP or HDLC, the link layer periodically sends keepalive packets to the peer end. If the local end does not receive any keepalive message from the peer end within a specified period, the link layer considers the peer end as failed and reports the link layer down event. You can use the **timer-hold** command to set the interval at which keepalive messages are sent.

On a link with a very low speed, the link might be shut down if the *seconds* argument is too small. On a low-speed link, it takes a long time to transmit a large packet, which delays the sending and receiving of keepalive messages. If an interface fails to receive any keepalive message from the peer within multiple intervals, the link is considered as failed. If the delay of keepalive messages exceeds the limit, the link is shut down because it is considered as failed.

Examples

Set the polling interval to 15 seconds for interface POS 5/1.

```
<Sysname> system-view
[Sysname] interface pos 5/1
[Sysname-Pos5/1] timer-hold 15
```

Loopback, null, and inloopback interface commands

bandwidth

Use **bandwidth** to configure the expected bandwidth of an interface.

Use **undo bandwidth** to restore the default.

Syntax

bandwidth *bandwidth-value*

undo bandwidth

Default

The expected bandwidth of a loopback interface is 0 kbps.

Views

Loopback interface view

Predefined user roles

network-admin

Parameters

bandwidth-value: Specifies the expected bandwidth in the range of 1 to 400000000 kbps.

Usage guidelines

The expected bandwidth of an interface affects the following items:

- Bandwidth assignment with CBQ. For more information, see *ACL and QoS Configuration Guide*.
- Link costs in OSPF, OSPFv3, and IS-IS. For more information, see *Layer 3—IP Routing Configuration Guide*.

Examples

Set the expected bandwidth of Loopback 1 to 1000 kbps.

```
<Sysname> system-view
[Sysname] interface loopback 1
[Sysname-LoopBack1] bandwidth 1000
```

default

Use **default** to restore the default settings for a loopback or null interface.

Syntax

default

Views

Loopback interface view, null interface view

Predefined user roles

network-admin

Usage guidelines

CAUTION:

The **default** command might interrupt ongoing network services. Make sure you are fully aware of the impacts of this command before using it on a live network.

This command might fail to restore the default settings for some commands for reasons such as command dependencies and system restrictions. Use the **display this** command in interface view to identify these commands, and then use their **undo** forms or follow the command reference to individually restore their default settings. If your restoration attempt still fails, follow the error message instructions to resolve the problem.

Examples

Restore the default settings for interface loopback 1.

```
<Sysname> system-view
[Sysname] interface loopback 1
[Sysname-LoopBack1] default
```

description

Use **description** to set a description for an interface.

Use **undo description** to restore the default.

Syntax

description *text*

undo description

Default

The description of a loopback or null interface is the *interface name* plus **Interface** (for example, **LoopBack1 Interface**).

Views

Loopback interface view, null interface view

Predefined user roles

network-admin

Parameters

text: Specifies an interface description, a string of 1 to 255 characters.

Usage guidelines

Configure a description for an interface for easy identification and management purposes.

You can use the **display interface** command to view the configured description.

Examples

Set the description to **for RouterID** for interface loopback 1.

```
<Sysname> system-view
[Sysname] interface loopback 1
```

```
[Sysname-LoopBack1] description for RouterID
```

display interface inloopback

Use **display interface inloopback** to display information about the inloopback interface.

Syntax

display interface [**inloopback** [**0**]] [**brief** [**description**]]

Views

Any view

Predefined user roles

network-admin

network-operator

Parameters

0: Specifies interface Inloopback 0.

brief: Displays brief interface information. If you do not specify this keyword, the command displays detailed interface information.

description: Displays complete interface descriptions. If you do not specify this keyword, the command displays only the first 27 characters of interface descriptions. The description of an inloopback interface is always **InLoopBack0 Interface** and cannot be configured.

Usage guidelines

If the **inloopback** keyword is not specified, the command displays information about all interfaces of the device.

If the **inloopback** keyword is specified but the **0** keyword is not specified, the command displays information about interface Inloopback 0, because the device has only one inloopback interface Inloopback 0.

Examples

Display detailed information about interface Inloopback 0.

```
<Sysname> display interface inloopback 0
InLoopBack0
Current state: UP
Line protocol state: UP (spoofing)
Description: InLoopBack0 Interface
Bandwidth: 0kbps
Maximum Transmit Unit: 1536
Internet protocol processing: disabled
Physical: InLoopBack
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, 0 drops
Output: 0 packets, 0 bytes, 0 drops
```

Table 20 Command output

Field	Description
Current state	Physical layer state of the interface, which is always **UP**, meaning that the inloopback interface can receive and transmit packets.
Line protocol state	Data link layer protocol state of the interface, which is always **UP (spoofing)**. **UP (spoofing)** means that the data link layer protocol state of the interface is **UP** but the link is an on-demand link or not present at all.
Description	Description string of the interface, which is always **InLoopBack0 Interface** and cannot be configured.
Bandwidth	Expected bandwidth of the interface.
Maximum Transmit Unit	MTU of the interface, which is always 1536 and cannot be configured
Internet protocol processing: disabled	The IP address of the inloopback interface is always 127.0.0.1 and cannot be configured.
Physical: InLoopBack	The physical type of the interface is inloopback.
Last 300 seconds input: 0 bytes/sec, 0 bits/sec, 0 packets/sec	Average input rate during the last 300 seconds (displayed when the interface supports traffic statistics collection): • **bytes/sec**—Average number of bytes received per second. • **bits/sec**—Average number of bits received per second. • **packets/sec**—Average number of packets received per second.
Last 300 seconds output: 0 bytes/sec, 0 bits/sec, 0 packets/sec	Average output rate over the last 300 seconds (displayed when the interface supports traffic statistics collection): • **bytes/sec**—Average number of bytes sent per second. • **bits/sec**—Average number of bits sent per second. • **packets/sec**—Average number of packets sent per second.
Input: 0 packets, 0 bytes, 0 drops	Total number and size (in bytes) of incoming packets of the interface and the number of dropped packets (displayed when the interface supports traffic statistics collection).
Output: 0 packets, 0 bytes, 0 drops	Total number and size (in bytes) of outgoing packets of the interface and the number of dropped packets (displayed when the interface supports traffic statistics collection).

Display brief information about interface Inloopback 0.

```
<Sysname> display interface inloopback 0 brief
Brief information on interface(s) under route mode:
Link: ADM - administratively down; Stby - standby
Protocol: (s) - spoofing
Interface            Link Protocol Main IP         Description
InLoop0              UP   UP(s)    127.0.0.1
```

Display brief information about interface Inloopback 0, including the full description of the inloopback interface.

```
<Sysname> display interface inloopback 0 brief description
Brief information on interface(s) under route mode:
Link: ADM - administratively down; Stby - standby
Protocol: (s) - spoofing
Interface            Link Protocol Main IP         Description
```

```
InLoop0              UP   UP(s)    127.0.0.1
```

Table 21 Command output

Field	Description
Brief information on interface(s) under route mode:	Brief information about the inloopback interface.
Link: ADM - administratively down; Stby - standby	**Link attribute of the interface:** • **ADM**—The interface has been shut down by the network administrator. To recover its physical layer state, run the **undo shutdown** command. • **Stby**—The interface is a standby interface.
Protocol: (s) - spoofing	Protocol attribute of the interface. **(s)** represents the spoofing flag. If the data link layer protocol of an interface is up but its link is an on-demand link or not present at all, the **Protocol** field displays **UP(s)**. This attribute is typical of interface Null 0, Inloopback 0, and loopback interfaces.
Interface	Interface name.
Link	Physical layer state of the interface, which is always **UP**, meaning that the link is physically up.
Protocol	Data link layer protocol state of the interface, which is always **UP(s)**. **UP(s)** means that the data link layer protocol state of the interface is **UP** but the link of the interface is an on-demand link or not present at all.
Main IP	IP address of the interface, which is always 127.0.0.1 and cannot be configured.
Description	Interface description configured by using the **description** command. If the **description** keyword is not specified in the **display interface brief** command, the Description field allows a maximum of 27 characters. If the **description** keyword is specified in the **display interface brief** command, the field displays the full interface description. The description of an inloopback interface cannot be configured.

display interface loopback

Use **display interface loopback** to display information about the specified or all existing loopback interfaces.

Syntax

display interface [**loopback**] [**brief** [**down**]]

display interface [**loopback** [*interface-number*]] [**brief** [**description**]]

Views

Any view

Predefined user roles

network-admin

network-operator

Parameters

interface-number: Specifies a loopback interface by its number, which can be the number of any existing loopback interface. If you do not specify this argument, the command displays information about all existing loopback interfaces on the device.

brief: Displays brief interface information. If you do not specify this keyword, the command displays detailed interface information.

down: Displays information about interfaces in down state and the causes. Without this keyword, the command displays information about interfaces in all states.

description: Displays complete interface descriptions. If you do not specify this keyword, the command displays only the first 27 characters of interface descriptions.

Usage guidelines

This command is supported only after a loopback interface is created.

If the **loopback** keyword is not specified, the command displays information about all interfaces of the device.

If the **loopback** keyword is specified but the *interface-number* argument is not specified, the command displays information about all existing loopback interfaces.

Examples

Display detailed information about interface loopback 0. (Suppose the loopback interface supports traffic statistics collection.)

```
<Sysname> display interface loopback 0
LoopBack0
Current state: UP
Line protocol state: UP (spoofing)
Description: LoopBack0 Interface
Bandwidth: 0kbps
Maximum Transmit Unit: 1536
Internet protocol processing: disabled
Physical: Loopback
Last clearing of counters:  Never
Last 300 seconds input:  0 bytes/sec, 0 bits/sec, 0 packets/sec
Last 300 seconds output:  0 bytes/sec, 0 bits/sec, 0 packets/sec
Input: 0 packets, 0 bytes, 0 drops
Output: 0 packets, 0 bytes, 0 drops
```

Display detailed information about interface loopback 0. (Suppose the loopback interface does not support traffic statistics collection.)

```
<Sysname> display interface loopback 0
LoopBack0
Current state: UP
Line protocol state: UP (spoofing)
Description: LoopBack0 Interface
Maximum Transmit Unit: 1536
Internet protocol processing : disabled
Physical: Loopback
Last clearing of counters:  Never
```

Table 22 Command output

Field	Description
Current state	Physical layer state of the interface: • **UP**—The loopback interface can receive and transmit packets. • **Administratively DOWN**—The interface was manually shut down by using the **shutdown** command.
Line protocol state	Data link layer protocol state of the interface, which is always **UP (spoofing)**. **UP (spoofing)** means that the data link layer protocol state of the interface is **UP** but the link is an on-demand link or not present at all.
Description	Description string of the interface.
Bandwidth	Expected bandwidth of the interface.
Maximum Transmit Unit	MTU of the interface.
Internet protocol processing: disabled	Indicates that the interface cannot process Layer 3 packets (displayed when the interface is not configured with an IP address).
Internet Address is 1.1.1.1/32 Primary	Primary IP address of the interface (displayed when the interface is configured with a primary IP address).
Physical: Loopback	The physical type of the interface is loopback.
Last clearing of counters	Time when statistics on the logical interface were last cleared by using the **reset counters interface** command. If the statistics of the interface have never been cleared by using the **reset counters interface** command since the device started, this field displays **Never**.
Last 300 seconds input: 0 bytes/sec, 0 bits/sec, 0 packets/sec	Average input rate during the last 300 seconds (displayed when the interface supports traffic statistics collection): • **bytes/sec**—Average number of bytes received per second. • **bits/sec**—Average number of bits received per second. • **packets/sec**—Average number of packets received per second.
Last 300 seconds output: 0 bytes/sec, 0 bits/sec, 0 packets/sec	Average output rate over the last 300 seconds (displayed when the interface supports traffic statistics collection): • **bytes/sec**—Average number of bytes sent per second. • **bits/sec**—Average number of bits sent per second. • **packets/sec**—Average number of packets sent per second.
Input: 0 packets, 0 bytes, 0 drops	Total number and size (in bytes) of incoming packets of the interface and the number of dropped packets (displayed when the interface supports traffic statistics collection).
Output: 0 packets, 0 bytes, 0 drops	Total number and size (in bytes) of outgoing packets of the interface and the number of dropped packets (displayed when the interface supports traffic statistics collection).

Display brief information about all loopback interfaces.

```
<Sysname> display interface loopback brief
Brief information on interface(s) under route mode:
Link: ADM - administratively down; Stby - standby
Protocol: (s) - spoofing
```

```
Interface            Link Protocol Main IP         Description
Loop1                UP   UP(s)    --              aaaaaaaaaaaaaaaaaaaaaaaaaaaa
```

Display brief information about all existing loopback interfaces, including the full description of each loopback interface.

```
<Sysname> display interface loopback brief description
Brief information on interface(s) under route mode:
Link: ADM - administratively down; Stby - standby
Protocol: (s) - spoofing
Interface            Link Protocol Main IP         Description
Loop1                UP   UP(s)    --              aaaaaaaaaaaaaaaaaaaaaaaaaaaaa
```

Display information about all loopback interfaces in down state and the causes.

```
<Sysname> display interface loopback brief down
Brief information on interface(s) under route mode:
Link: ADM - administratively down; Stby - standby
Interface            Link Cause
Loop1                ADM  Administratively
```

Table 23 Command output

Field	Description
Brief information on interface(s) under route mode:	Brief information about loopback interfaces.
Link: ADM - administratively down; Stby - standby	Link attribute of the interface: • **ADM**—The interface has been shut down by the network administrator. To recover its physical layer state, run the **undo shutdown** command. • **Stby**—The interface is a standby interface.
Protocol: (s) - spoofing	Protocol attribute of the interface. **(s)** represents the spoofing flag. If the data link layer protocol of an interface is up but its link is an on-demand link or not present at all, the **Protocol** field displays **UP(s)**. This attribute is typical of interface Null 0, Inloopback 0, and loopback interfaces.
Interface	Interface name.
Link	Physical layer state of the interface: • **UP**—The interface is up. • **DOWN**—The interface is physically down. • **ADM**—The interface has been administratively shut down. To recover its physical state, run the **undo shutdown** command. • **Stby**—The interface is a standby interface.
Protocol	Data link layer protocol state of the interface, which is always **UP(s)**. **UP(s)** means that the data link layer protocol state of the interface is **UP** but the link of the interface is an on-demand link or not present at all.
Description	Interface description configured by using the **description** command. If the **description** keyword is not specified in the **display interface brief** command, the Description field allows a maximum of 27 characters. If the **description** keyword is specified in the **display interface brief** command, the field displays the full interface description.

Field	Description
Cause	Cause of the interface down event. If the interface has been shut down by using the **shutdown** command, this field displays **Administratively**. To restore the physical state of the interface, execute the **undo shutdown** command.

Related commands

- **interface loopback**
- **reset counters interface loopback**

display interface null

Use **display interface null** to display information about the null interface.

Syntax

display interface [**null** [**0**]] [**brief** [**description**]]

Views

Any view

Predefined user roles

network-admin

network-operator

Parameters

0: Specifies interface Null 0.

brief: Displays brief interface information. If you do not specify this keyword, the command displays detailed interface information.

description: Displays complete interface descriptions. If you do not specify this keyword, the command displays only the first 27 characters of interface descriptions.

Usage guidelines

If the **null** keyword is not specified, the command displays information about all interfaces of the device.

If the **null** keyword is specified but the **0** keyword is not specified, the command displays information about interface Null 0, because the device has only one null interface Null 0.

Examples

Display detailed information about interface Null 0.

```
<Sysname> display interface null 0
NULL0
Current state: UP
Line protocol state: UP (spoofing)
Description: NULL0 Interface
Bandwidth: 0kbps
Maximum Transmit Unit: 1500
Internet protocol processing: disabled
Physical: NULL DEV
Last clearing of counters: Never
```

```
Last 300 seconds input:  0 bytes/sec, 0 bits/sec, 0 packets/sec
Last 300 seconds output:  0 bytes/sec, 0 bits/sec, 0 packets/sec
Input: 0 packets, 0 bytes, 0 drops
Output: 0 packets, 0 bytes, 0 drops
```

Display brief information about interface Null 0.

```
<Sysname> display interface null 0 brief
Brief information on interface(s) under route mode:
Link: ADM - administratively down; Stby - standby
Protocol: (s) - spoofing
Interface            Link Protocol Main IP         Description
NULL0                UP   UP(s)    --              aaaaaaaaaaaaaaaaaaaaaaaaaa
```

Display brief information about interface Null 0, including the full description of the null interface.

```
<Sysname> display interface null 0 brief description
Brief information on interface(s) under route mode:
Link: ADM - administratively down; Stby - standby
Protocol: (s) - spoofing
Interface            Link Protocol Main IP         Description
NULL0                UP   UP(s)    --              aaaaaaaaaaaaaaaaaaaaaaaaaaaa
```

For the command output, see Table 22 and Table 23.

Related commands

- **interface null**
- **reset counters interface null**

interface loopback

Use **interface loopback** to create a loopback interface and enter loopback interface view.

Use **undo interface loopback** to remove a loopback interface.

Syntax

interface loopback *interface-number*

undo interface loopback *interface-number*

Default

No loopback interface exists.

Views

System view

Predefined user roles

network-admin

Parameters

interface-number: Specifies a loopback interface by its number in the range of 1 to 1023..

Usage guidelines

The physical layer state and link layer protocols of a loopback interface are always up unless the loopback interface is manually shut down. You can establish a connection to a loopback interface to prevent the connection from being affected by the physical state of the interface and to improve the

reliability of the connection. For example, you can configure a loopback interface as the source interface for establishing an FTP connection or use the loopback interface address as the Router ID in BGP.

Examples

Create interface loopback 1.

```
<Sysname> system-view
[Sysname] interface loopback 1
[Sysname-LoopBack1]
```

interface null

Use **interface null** to enter null interface view.

Syntax

interface null 0

Default

A device has only one null interface (Null 0), which cannot be created or deleted.

Views

System view

Predefined user roles

network-admin

Parameters

0: Specifies interface Null 0. The null interface number is fixed at 0.

Examples

Enter Null 0 interface view.

```
<Sysname> system-view
[Sysname] interface null 0
[Sysname-NULL0]
```

reset counters interface loopback

Use **reset counters interface loopback** to clear the statistics on the specified or all loopback interfaces.

Syntax

reset counters interface loopback [*interface-number*]

Views

User view

Predefined user roles

network-admin

Parameters

interface-number: Specifies a loopback interface by its number, which can be the number of any existing loopback interface. If you do not specify the *interface-number* argument, the command clears the statistics on all loopback interfaces.

Usage guidelines

To determine whether a loopback interface works correctly within a period by collecting the traffic statistics within that period, first use the **reset counters interface** [**loopback** [*interface-number*]] command to clear the statistics, and then have the interface automatically collect the statistics.

This command is available only if at least one loopback interface has been created.

Examples

Clear the statistics on loopback interface Loopback 1.

```
<Sysname> reset counters interface loopback 1
```

Related commands

display interface loopback

reset counters interface null

Use **reset counters interface null** to clear the statistics on the null interface.

Syntax

reset counters interface [**null** [**0**]]

Views

User view

Predefined user roles

network-admin

Parameters

0: Specifies the number of the null interface, which is fixed at 0.

Usage guidelines

To determine whether the null interface works correctly within a period by collecting the traffic statistics within that period, first use the **reset counters interface** [**null** [**0**]] command to clear the statistics, and then have the interface automatically collect the statistics.

Examples

Clear the statistics on interface Null 0.

```
<Sysname> reset counters interface null 0
```

Related commands

display interface null

shutdown

Use **shutdown** to shut down a loopback interface.

Use **undo shutdown** to bring up a loopback interface.

Syntax

shutdown

undo shutdown

Default

A loopback interface is up.

Views

Loopback interface view

Predefined user roles

network-admin

Usage guidelines

Use the **shutdown** command with caution, because the command disconnects the connection of the interface and disables the interface from communicating.

Examples

Shut down interface loopback 1.

```
<Sysname> system-view
[Sysname] interface loopback 1
[Sysname-LoopBack1] shutdown
```

Support and other resources

Contacting HP

For worldwide technical support information, see the HP support website:

http://www.hp.com/support

Before contacting HP, collect the following information:

- Product model names and numbers
- Technical support registration number (if applicable)
- Product serial numbers
- Error messages
- Operating system type and revision level
- Detailed questions

Subscription service

HP recommends that you register your product at the Subscriber's Choice for Business website:

http://www.hp.com/go/wwalerts

After registering, you will receive email notification of product enhancements, new driver versions, firmware updates, and other product resources.

Related information

Documents

To find related documents, browse to the Manuals page of the HP Business Support Center website:

http://www.hp.com/support/manuals

- For related documentation, navigate to the Networking section, and select a networking category.
- For a complete list of acronyms and their definitions, see *HP FlexNetwork Technology Acronyms*.

Websites

- HP.com http://www.hp.com
- HP Networking http://www.hp.com/go/networking
- HP manuals http://www.hp.com/support/manuals
- HP download drivers and software http://www.hp.com/support/downloads
- HP software depot http://www.software.hp.com
- HP Education http://www.hp.com/learn

Conventions

This section describes the conventions used in this documentation set.

Command conventions

Convention	Description
Boldface	**Bold** text represents commands and keywords that you enter literally as shown.
Italic	*Italic* text represents arguments that you replace with actual values.
[ ]	Square brackets enclose syntax choices (keywords or arguments) that are optional.
{ x | y | ... }	Braces enclose a set of required syntax choices separated by vertical bars, from which you select one.
[x | y | ...]	Square brackets enclose a set of optional syntax choices separated by vertical bars, from which you select one or none.
{ x | y | ... } *	Asterisk-marked braces enclose a set of required syntax choices separated by vertical bars, from which you select at least one.
[x | y | ...] *	Asterisk-marked square brackets enclose optional syntax choices separated by vertical bars, from which you select one choice, multiple choices, or none.
&<1-n>	The argument or keyword and argument combination before the ampersand (&) sign can be entered 1 to n times.
#	A line that starts with a pound (#) sign is comments.

GUI conventions

Convention	Description
Boldface	Window names, button names, field names, and menu items are in bold text. For example, the **New User** window appears; click **OK**.
>	Multi-level menus are separated by angle brackets. For example, **File** > **Create** > **Folder**.

Symbols

Convention	Description
WARNING	An alert that calls attention to important information that if not understood or followed can result in personal injury.
CAUTION	An alert that calls attention to important information that if not understood or followed can result in data loss, data corruption, or damage to hardware or software.
IMPORTANT	An alert that calls attention to essential information.
NOTE	An alert that contains additional or supplementary information.
TIP	An alert that provides helpful information.

Network topology icons

	Represents a generic network device, such as a router, switch, or firewall.
	Represents a routing-capable device, such as a router or Layer 3 switch.
	Represents a generic switch, such as a Layer 2 or Layer 3 switch, or a router that supports Layer 2 forwarding and other Layer 2 features.
	Represents an access controller, a unified wired-WLAN module, or the switching engine on a unified wired-WLAN switch.
	Represents an access point.
	Represents a security product, such as a firewall, a UTM, or a load-balancing or security card that is installed in a device.
	Represents a security card, such as a firewall card, a load-balancing card, or a NetStream card.

Port numbering in examples

The port numbers in this document are for illustration only and might be unavailable on your device.

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