

H3C MSR1000[2600][3600] Routers

Comware 9 Layer 2—WAN Access

Command Reference

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Preface

This command reference covers the commands of WAN access technologies.

This preface includes the following topics about the documentation:

- [Audience.](#)
- [Conventions.](#)
- [Documentation feedback.](#)

Audience

This documentation is intended for:

- Network planners.
- Field technical support and servicing engineers.
- Network administrators.

Conventions

The following information describes the conventions used in the documentation.

Command conventions

Convention	Description
Boldface	Bold text represents commands and keywords that you enter literally as shown.
<i>Italic</i>	<i>Italic</i> 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 a minimum of 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 Boldface. For example, the New User window opens; 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

Convention	Description
	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 access controller engine on a unified wired-WLAN switch.
	Represents an access point.
	Represents a wireless terminator unit.
	Represents a wireless terminator.
	Represents a mesh access point.
	Represents omnidirectional signals.
	Represents directional signals.
	Represents a security product, such as a firewall, UTM, multiservice security gateway, or load balancing device.
	Represents a security module, such as a firewall, load balancing, NetStream, SSL VPN, IPS, or ACG module.

Examples provided in this document

Examples in this document might use devices that differ from your device in hardware model, configuration, or software version. It is normal that the port numbers, sample output, screenshots, and other information in the examples differ from what you have on your device.

Documentation feedback

You can e-mail your comments about product documentation to info@h3c.com.

We appreciate your comments.

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PPP and MP commands

PPP commands

bandwidth

Use **bandwidth** to set 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

VT interface view

MP-group 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 Virtual-Template 10 to 1000 kbps.

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

```
[Sysname] interface virtual-template 10
```

```
[Sysname-Virtual-Template10] bandwidth 1000
```

Set the expected bandwidth of MP-group 0/0/1 to 1000 kbps.

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

```
[Sysname] interface mp-group 0/0/1
```

```
[Sysname-MP-group0/0/1] bandwidth 1000
```

default

Use **default** to restore the default settings for a VT or MP-group interface.

Syntax

default

Views

VT interface view

MP-group 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 impact 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 or system restrictions. Use the **display this** command in interface view to identify these commands. Use the **undo** forms of these commands 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 Virtual-Template 10.

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

```
[Sysname] interface virtual-template 10
```

```
[Sysname-Virtual-Template10] default
```

Restore the default settings of MP-group 0/0/1.

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

```
[Sysname] interface mp-group 0/0/1
```

```
[Sysname-MP-group0/0/1] default
```

description

Use **description** to set the description for a VT or MP-group interface.

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

Syntax

description *text*

undo description

Default

The description for a VT or MP-group interface is *interface name* **Interface** (for example, **Virtual-Template1 Interface** or **MP-group0/0/1 Interface**).

Views

VT interface view

MP-group interface view

Predefined user roles

network-admin

Parameters

text: Specifies the interface description, a case-sensitive string of 1 to 255 characters.

Examples

Set the description for Virtual-Template 10 to **virtual-interface**.

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

```
[Sysname] interface virtual-template 10
[Sysname-Virtual-Template10] description virtual-interface
# Set the description for MP-group 0/0/1 to mpgroup-interface.
<Sysname> system-view
[Sysname] interface mp-group 0/0/1
[Sysname-MP-group0/0/1] description mpgroup-interface
```

display interface virtual-access

Use **display interface virtual-access** to display information about VA interfaces.

Syntax

```
display interface [ virtual-access [ interface-number ] ] [ brief
[ description | down ] ]
```

Views

Any view

Predefined user roles

network-admin
network-operator

Parameters

virtual-access [*interface-number*]: Specifies an existing VA interface by its number. If you do not specify the **virtual-access** keyword, the command displays information about all interfaces except VA interfaces on the device. If you specify the **virtual-access** keyword without the *interface-number* argument, the command displays information about all VA interfaces.

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

description: Displays interface description information. This keyword does not apply to VA interfaces because VA interfaces do not support description configuration.

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

Examples

```
# Display information about Virtual-Access 1.
<Sysname> display interface virtual-access 1
Virtual-Access1
Current state: UP
Line protocol state: UP
Description: Virtual-Access1 Interface
Bandwidth: 1920kbps
Maximum transmission unit: 1500
Hold timer: 10 seconds, retry times: 5
Internet address: 122.1.1.1/24 (primary)
Link layer protocol: PPP
LCP: opened, MP: opened, IPCP: opened
Physical: MP, baudrate: 1920000 bps
Main interface: Virtual-Template1
```

```

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 link flapping: Never
Last clearing of counters: Never
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: 2 packets, 24 bytes, 0 drops
Output: 2 packets, 24 bytes, 0 drops

```

Display brief information about Virtual-Access 1.

```
<Sysname> display interface virtual-access 1 brief
```

Brief information on interfaces in route mode:

Link: ADM - administratively down; Stby - standby

Protocol: (s) - spoofing

Interface	Link	Protocol	Primary IP	Description
VA1	DOWN	DOWN	--	

Display brief information about VA interfaces in physically down state and the causes.

```
<Sysname> display interface virtual-access brief down
```

Brief information on interfaces in route mode:

Link: ADM - administratively down; Stby - standby

Interface	Link	Cause
VA1	DOWN	Not connected

Table 1 Command output

Field	Description
Current state	Physical and administrative states of the interface: DOWN—The interface is administratively up but physically down. UP—The interface is both administratively and physically up.
Line protocol state	Data link layer state: UP or DOWN.
Description	Interface description.
Bandwidth	Expected bandwidth of the interface.
Hold timer	Interval at which the interface sends keepalive packets.
retry times	Keepalive retry limit. The interface determines that its peer has been down if it does not receive a keepalive response when the keepalive retry limit is reached.
Internet protocol processing: Disabled	The interface cannot process IP packets currently.
Internet address: <i>ip-address/mask-length (Type)</i>	IP address of the interface and type of the address in parentheses. Possible IP address types include: Primary—Manually configured primary IP address. Sub—Manually configured secondary IP address. If the interface has both primary and secondary IP addresses, the primary IP address is displayed. If the interface has only secondary IP addresses, the lowest secondary IP address is displayed. DHCP-allocated—DHCP allocated IP address. For more information, see DHCP client configuration in <i>Layer 3—IP</i>

Field	Description
	<i>Services Configuration Guide.</i> • BOOTP-allocated—BOOTP allocated IP address. For more information, see BOOTP client configuration in <i>Layer 3—IP Services Configuration Guide</i>. • PPP-negotiated—IP address assigned by a PPP server during PPP negotiation. • Unnumbered—IP address borrowed from another interface. • MTunnel—IP address of the multicast tunnel interface (MTI), which is the same as the IP address of the MVPN source interface. For more information, see multicast VPN configuration in <i>IP Multicast Configuration Guide</i>.
LCP: opened, MP: opened, IPCP: opened	The PPP connection has been successfully established.
Physical	Physical type of the interface.
Main interface	VT interface associated with the VA interface.
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	Traffic statistics of the interface output queues.
Last link flapping	The amount of time that has elapsed since the most recent physical state change of the interface. This field displays Never if the interface has been physically down since device startup.
Last clearing of counters: Never	Last time when statistics on the interface were cleared. Never indicates that statistics on the interface were never cleared.
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	Average rate of input packets and output packets in the last 300 seconds.
Input: 2 packets, 24 bytes, 0 drops	Total number of inbound packets of the interface (in the number of packets and in bytes), and the number of packets dropped among the inbound packets.
Output: 2 packets, 24 bytes, 0 drops	Total number of outbound packets of the interface (in the number of packets and in bytes), and the number of packets dropped among the outbound packets.
Brief information on interfaces in 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, execute the undo shutdown command. • Stby—The interface is a backup interface. To see the primary interface, use the display interface-backup state command in <i>High Availability Command Reference</i>.
Protocol: (s) - spoofing	Indicates the line protocol is UP, but the physical link is an on-demand link or is not present.
Interface	Abbreviated interface name.
Link	Physical link state of the interface: • UP—The interface is physically up.

Field	Description
	DOWN—The interface is physically down.
Protocol	Line protocol state: UP—The line protocol is up. DOWN—The line protocol is down. UP(s)—The line protocol is up, but the physical link is an on-demand link or is not present.
Primary IP	Primary IP address of the interface.
Description	Interface description configured by using the description command. This field does not apply to VA interfaces because VA interfaces do not support description configuration.
Cause	Cause for the physical state of the interface to be Down. Not connected indicates no physical link exists (possibly because the network cable is disconnected or faulty).

Related commands

`reset counters interface virtual-access`

display interface virtual-template

Use **display interface virtual-template** to display information about VT interfaces.

Syntax

```
display interface [ virtual-template [ interface-number ] ] [ brief
[ description | down ] ]
```

Views

Any view

Predefined user roles

network-admin

network-operator

Parameters

virtual-template [*interface-number*]: Specifies an existing VT interface by its number. If you do not specify the **virtual-template** keyword, the command displays information about all interfaces except VA interfaces on the device. If you specify the **virtual-template** keyword without the *interface-number* argument, the command displays information about all existing VT interfaces.

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

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

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

Examples

```
# Display detailed information about Virtual-Template 1.
<Sysname> display interface virtual-template 1
```

```

Virtual-Template1
Current state: DOWN
Line protocol state: DOWN
Description: Virtual-Template1 Interface
Bandwidth: 100000kbps
Maximum transmission unit: 1500
Hold timer: 10 seconds, retry times: 5
Internet address: 192.168.1.200/24 (primary)
Link layer protocol: PPP
LCP: initial
Physical: None, baudrate: 1000000000 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

# Display brief information about Virtual-Template 1.
<Sysname> display interface virtual-template 1 brief
Brief information on interfaces in route mode:
Link: ADM - administratively down; Stby - standby
Protocol: (s) - spoofing
Interface          Link Protocol Primary IP      Description
VT1                DOWN DOWN      --

# Display brief information about the VT interfaces in physically down state and the causes.
<Sysname> display interface Virtual-Template brief down
Brief information on interfaces in route mode:
Link: ADM - administratively down; Stby - standby
Interface          Link Cause
VT0                DOWN Not connected
VT12               DOWN Not connected
VT1023             DOWN Not connected

```

Table 2 Command output

Field	Description
Current state	Physical state of the interface. This field for a VT interface can only be DOWN .
Line protocol state	Data link layer state. This field for a VT interface can only be DOWN .
Description	Interface description.
Bandwidth	Expected bandwidth of the interface.
Hold timer	Interval at which the interface sends keepalive packets.
retry times	Keepalive retry limit. The interface determines that its peer has been down if it does not receive a keepalive response when the keepalive retry limit is reached.
Internet protocol processing: Disabled	The interface cannot process IP packets currently.
Internet address: <i>ip-address/mask-length (Type)</i>	IP address of the interface and type of the address in parentheses. Possible IP address types include: Primary—Manually configured primary IP address.

Field	Description
	• Sub—Manually configured secondary IP address. If the interface has both primary and secondary IP addresses, the primary IP address is displayed. If the interface has only secondary IP addresses, the lowest secondary IP address is displayed. • DHCP-allocated—DHCP allocated IP address. For more information, see DHCP client configuration in <i>Layer 3—IP Services Configuration Guide</i>. • BOOTP-allocated—BOOTP allocated IP address. For more information, see BOOTP client configuration in <i>Layer 3—IP Services Configuration Guide</i>. • PPP-negotiated—IP address assigned by a PPP server during PPP negotiation. • Unnumbered—IP address borrowed from another interface. • MTunnel—IP address of the multicast tunnel interface (MTI), which is the same as the IP address of the MVPN source interface. For more information, see multicast VPN configuration in <i>IP Multicast Configuration Guide</i>.
LCP initial	LCP initialization is complete.
Physical	Physical type of the interface.
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)	Traffic statistics of the interface output queues.
Brief information on interfaces in 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, use the undo shutdown command. • Stby—The interface is operating as a backup interface. To see the primary interface, use the display interface-backup state command in <i>High Availability Command Reference</i>.
Protocol: (s) - spoofing	Indicates the line protocol is UP, but the physical link is an on-demand link or is not present.
Interface	Abbreviated interface name.
Link	Physical link state of the interface. This field for a VT interface can only be DOWN .
Protocol	Line protocol state of the interface. This field for a VT interface can only be DOWN .
Primary IP	Primary IP address of the interface.
Description	Interface description configured by using the description command. If you do not specify the description keyword, the display interface brief command displays a maximum of 27 characters of the description. If you specify the description keyword, the command displays the complete description.
Cause	Causes for the physical state of the interface to be Down. Not connected indicates no physical link exists (possibly because the network cable is disconnected or faulty).

display ip pool

Use **display ip pool** to display PPP address pools.

Syntax

display ip pool [*pool-name* | **group** *group-name*]

Views

Any view

Predefined user roles

network-admin

network-operator

Parameters

pool-name: Specifies a PPP address pool by its name, a case-sensitive string of 1 to 31 characters.

group group-name: Displays PPP address pools in a group specified by its name, a case-sensitive string of 1 to 31 characters.

Usage guidelines

If you do not specify any parameters, the command displays brief information about all PPP address pools.

If you specify an address pool, the command displays detailed information about the specified PPP address pool.

Examples

Display brief information about all PPP address pools.

```
<Sysname> display ip pool
```

Group name: a

Pool name	Start IP address	End IP address	Free	In use
aaa1	1.1.1.1	1.1.1.5	5	0
aaa2	1.1.1.6	1.1.1.10	5	0

Group name: b

Pool name	Start IP address	End IP address	Free	In use
bbb	1.1.2.1	1.1.2.5	4	1
	2.2.2.1	2.2.2.5	5	0

Display brief information about the PPP address pools in group **a**.

```
<Sysname> display ip pool group a
```

Group name: a

Pool name	Start IP address	End IP address	Free	In use
aaa1	1.1.1.1	1.1.1.5	5	0
aaa2	1.1.1.6	1.1.1.10	5	0

Display detailed information about PPP address pool **bbb**.

```
<Sysname> display ip pool bbb
```

Group name: b

Pool name	Start IP address	End IP address	Free	In use
bbb	1.1.2.1	1.1.2.5	4	1
	2.2.2.1	2.2.2.5	5	0

In use IP addresses:

IP address	Interface
1.1.1.2.1	Virtual-Template1

Table 3 Command output

Field	Description
Free	Number of free IP addresses.
In use	Number of IP addresses that have been assigned.
In use IP addresses	Information about the IP addresses that have been assigned.
Interface	Local interface that requests the IP address for the peer interface.

Related commands

ip pool

display ppp access-user

Use **display ppp access-user** to display PPP user information.

Syntax

```
display ppp access-user { domain domain-name | interface interface-type
interface-number [ count ] | ip-address ipv4-address | ipv6-address
ipv6-address | username user-name | user-type { lac | lns | pppoa | pppoe }
[ count ] }
```

Views

Any view

Predefined user roles

network-admin
network-operator

Parameters

domain *domain-name*: Displays information about PPP access users coming online through an ISP domain specified by its name, a case-sensitive string of 1 to 255 characters.

interface *interface-type interface-number*: Displays brief information about PPP users on the specified interface.

ip-address *ipv4-address*: Displays detailed information about the PPP user specified by its IPv4 address.

ipv6-address *ipv6-address*: Displays detailed information about the PPP user specified by its IPv6 address.

username *user-name*: Displays detailed information about the PPP user specified by its username, a case-sensitive string of 1 to 80 characters.

user - type: Displays brief information about online users of the specified type.

lac: Displays brief information about L2TP users for an LAC.

lns: Displays brief information about L2TP users for an LNS.

pppoa: Displays brief information about PPPoA users.

pppoe: Displays brief information about PPPoE users.

count: Displays the total number of PPP users matching the specified criterion.

Usage guidelines

Brief information about a PPP user includes the following:

- Brief name of the VA interface.
- Username.
- MAC address.
- IPv4 address, IPv6 address, or IPv6 prefix of the PPP user.

Detailed information about a PPP user includes the following:

- Brief name of the VA interface.
- User ID.
- Username.
- Authentication information.
- Uplink and downlink traffic.
- Access start time of the PPP user.

In an L2TP network, this command is supported on an LAC only if a remote system dials in to the LAC through a PPPoE network. For more information about L2TP, see L2TP configuration in *User Access and Authentication Configuration Guide*.

Examples

Display brief information about PPP users on GigabitEthernet 0/0/1.

```
<Sysname> display ppp access-user interface gigabitethernet 0/0/1
```

Interface	Username	MAC address	IP address	IPv6 address	IPv6 PDPrefix
VA0	user1@dm1	0001-0101-9101	192.168.100.173	-	-
VA1	user2@dm2	0001-0101-9101	192.168.80.173	2000::1	-

Display the total number of PPP users on GigabitEthernet 0/0/1.

```
<Sysname> display ppp access-user interface gigabitethernet 0/0/1 count
```

Total users: 2

Table 4 Command output

Field	Description
Interface	Name of the VA interface corresponding to the user.
Username	Username of the user. A hyphen (-) means that the user does not need authentication.
MAC address	MAC address of the user. A hyphen (-) means that the user is not a PPPoE user.
IP address	IP address of the user. A hyphen (-) means that no IP address is assigned to the user.
IPv6 address	IPv6 address of the user. A hyphen (-) means that no IPv6 address is assigned to the user.
IPv6 PD prefix	IPv6 prefix of the user. A hyphen (-) means that no IPv6 prefix is assigned to the user.
Total users	Total number of PPP users.

Display detailed information about the PPP user whose IP address is 50.50.50.3.

```
<Sysname> display ppp access-user ip-address 50.50.50.3
```

Basic:

Interface: VA0

User ID: 0x28000002
Username: user1@hrss
Domain: hrss
Access interface: RAGG2
Service-VLAN/Customer-VLAN: -/-
MAC address: 0000-0000-0001
IP address: 50.50.50.3
IPv6 address: -
IPv6 PD prefix: -
VPN instance: 123
Access type: PPPoE
Authentication type: CHAP

AAA:

Authentication state: Authenticated
Authorization state: Authorized
Realtime accounting switch: Open
Realtime accounting interval: 60s
Login time: 2019-1-19 2:42:3:358
Accounting start time: 2019-1-19 2:42:3:382
Online time(hh:mm:ss): 0:7:34
Accounting state: Accounting
Idle cut: 0 sec 0 byte
Session timeout: 12000 s
Time remained: 8000 s
Byte remained: 20971520 bytes
Redirect WebURL: http://6.6.6.6

ACL&QoS:

User profile: profile123 (active)
User group profile: -
Inbound CAR: CIR 64000bps PIR 640000bps CBS 500bit
Outbound CAR: CIR 64000bps PIR 640000bps CBS 500bit

NAT:

Global IP address: 111.8.0.200
Port block: 28744-28748

Flow Statistic:

IPv4 uplink packets/bytes: 7/546
IPv4 downlink packets/bytes: 0/0
IPv6 uplink packets/bytes: 0/0
IPv6 downlink packets/bytes: 0/0

ITA:

Level-1 uplink packets/bytes: 100/128000
downlink packets/bytes: 200/256000
Level-2 uplink packets/bytes: 100/128000

downlink packets/bytes: 200/256000

Table 5 Command output

Field	Description
Basic	Basic information.
Interface	Brief name of the VA interface that corresponds to the user.
Username	Username of the user. A hyphen (-) means that the user does not need authentication.
Domain	ISP domain name for authentication. A hyphen (-) means that no ISP domain is specified for authentication.
Access interface	Name of the access interface of the user.
Service-VLAN/Customer-VLAN	Service provider VLAN and customer VLAN information of the user. A hyphen (-) means that no VLAN information is available.
IP address	IP address of the user. A hyphen (-) means that no IP address is assigned to the user.
IPv6 address	IPv6 address of the user. A hyphen (-) means that no IPv6 address is assigned to the user.
IPv6 PD prefix	Delegated IPv6 prefix of the user. A hyphen (-) means that no delegated IPv6 prefix is assigned to the user.
VPN instance	VPN instance to which the user belongs. A hyphen (-) means that the user is not bound to any VPN instance.
Access type	Access type of the user: • PPPoE. • PPPoA. • L2TP.
Authentication type	Authentication type of the user: • PAP. • CHAP. • MS-CHAP. • MS-CHAP-V2.
Authentication state	Authentication state of the user: • Idle—The user has not been authenticated. • Authenticating—The user is being authenticated. • Authenticated—The user has been authenticated.
Authorization state	Authorization state of the user: • Idle—The user has not been authorized. • Authorizing—The user is being authorized. • Authorized—The user has been authorized.
Realtime accounting switch	• Open—The switch is on. • Closed—The switch is off.
Realtime accounting interval	Realtime accounting interval in seconds. A hyphen (-) means that no real-time accounting interval is authorized.
Login time	Time when the user accessed the device through PPP.

Field	Description
Accounting start time	Time when accounting started. A hyphen (-) means that no accounting is performed on the user.
Online time(hh:mm:ss)	Online duration of the current login.
Accounting state	Accounting state of the user: • Accounting—Accounting is on. • Stop—Accounting stops.
Idle cut	Traffic threshold for logging off the user in idle state. If the traffic is less than the threshold within the specified period, the user is forcibly logged off.
Session timeout	Authorization time for the user, in seconds. A hyphen (-) means that no authorization time is specified for the user.
Time remained	Remaining time for the user to stay online, in seconds. A hyphen (-) means that no authorization time is specified for the user.
Byte remained	Remaining traffic for the user. A hyphen (-) means that no authorization traffic is specified for the user.
Redirect WebURL	Redirect Web URL address for the user. A hyphen (-) means that no redirect Web URL address is specified for the user.
User profile	Name of the authorized user profile. The hyphen (-) means that no user profile is authorized. The user profile has two states: • active—The authorized user profile is successfully issued. • inactive—The authorized user profile fails to be issued.
User group profile	Name of the authorized user group profile. The hyphen (-) means that no user group profile is authorized. The user group profile has two states: • active—The authorized user group profile is successfully issued. • inactive—The authorized user group profile fails to be issued.
Inbound CAR	Authorized inbound CAR parameters, which contain the CIR (in bps), the PIR (in bps), and the CBS (in bits).
Outbound CAR	Authorized outbound CAR parameters, which contain the CIR (in bps), the PIR (in bps), and the CBS (in bits).
Global IP address	Global IP address of the user. This field is displayed if NAT444 is used. For information about NAT444, see <i>NAT Configuration Guide</i> .
Port block	Port block of the user, from the start port to the end port. This field is displayed if NAT444 is used.
IPv4 uplink packets/bytes	Number of packets and bytes for IPv4 uplink traffic.
IPv4 downlink packets/bytes	Number of packets and bytes for IPv4 downlink traffic.
IPv6 uplink packets/bytes	Number of packets and bytes for IPv6 uplink traffic.
IPv6 downlink packets/bytes	Number of packets and bytes for IPv6 downlink traffic.

Field	Description
ITA	ITA statistics. ITA statistics are displayed after ITA is enabled. If the traffic-separate enable command is executed, ITA statistics are not included in flow statistics. For information about ITA and the traffic-separate enable command, see AAA configuration in <i>User Access and Authentication Configuration Guide</i> .
Level- <i>n</i> uplink packets/bytes downlink packets/bytes	Number of packets and bytes for uplink traffic at accounting level <i>n</i> . The value for <i>n</i> depends on the traffic level command, and its value range is 1 to 8.

Related commands

reset ppp access-user

display ppp compression iphc

Use **display ppp compression iphc** to display IP header compression (IPHC) statistics.

Syntax

```
display ppp compression iphc { rtp | tcp } [ interface interface-type
interface-number ]
```

Views

Any view

Predefined user roles

network-admin
network-operator

Parameters

rtp: Displays IPHC RTP header compression statistics.

tcp: Displays IPHC TCP header compression statistics.

interface *interface-type interface-number*: Specifies an interface by its type and number. If you do not specify this option, the command displays IPHC statistics on all interfaces.

Usage guidelines

When IPHC applies to an MP link, the following rules apply:

- If an MP template is used, such as a VT interface or a dialer interface, the associated VA interface performs IPHC. You can view the compression information on the VA interface.
- If an MP-group interface is used, the MP-group interface performs IPHC. You can view the compression information on the MP-group interface.

When IPHC applies to a normal PPP link, the physical interface performs IPHC. You can view the compression information on the physical interface.

Examples

```
# Display IPHC RTP header compression statistics.
<Sysname> display ppp compression iphc rtp
-----Slot1-----
Interface: Virtual-Access0
Received:
```

```

    Compressed/Error/Total: 0/0/0 packets
Sent:
    Compressed/Total: 0/0 packets
    Sent/Saved/Total: 0/0/0 bytes
    Packet-based compression ratio: 0%
    Byte-based compression ratio: 0%
Connections:
    Rx/Tx: 16/16
    Five-Minute-Miss: 0 (Misses/5Mins)
    Max-Miss: 0

-----Slot2-----
Interface: Virtual-Access0
Received:
    Compressed/Error/Total: 20/5/40 packets
Sent:
    Compressed/Total: 34/40 packets
    Sent/Saved/Total: 1131/1210/2341 bytes
    Packet-based compression ratio: 85%
    Byte-based compression ratio: 51%
Connections:
    Rx/Tx: 16/16
    Five-Minute-Miss: 0 (Misses/5Mins)
    Max-Miss: 0

# Display IPHC TCP header compression statistics.
<Sysname>display ppp compression iphc tcp
-----Slot1-----
Interface: Virtual-Access0
Received:
    Compressed/Error/Total: 0/0/0 packets
Sent:
    Compressed/Total: 0/0 packets
    Sent/Saved/Total: 0/0/0 bytes
    Packet-based compression ratio: 0%
    Byte-based compression ratio: 0%
Connections:
    Rx/Tx: 16/16
    Five-Minute-Miss: 0 (Misses/5Mins)
    Max-Miss: 0

-----Slot2-----
Interface: Virtual-Access0
Received:
    Compressed/Error/Total: 20/5/40 packets
Sent:
    Compressed/Total: 34/40 packets
    Sent/Saved/Total: 1131/1210/2341 bytes
    Packet-based compression ratio: 85%

```

Byte-based compression ratio: 51%

Connections:

Rx/Tx: 16/16

Five-Minute-Miss: 0 (Misses/5Mins)

Max-Miss: 0

Table 6 Command output

Field	Description
Received: Compressed/Error/Total	Statistics for received packets: • Compressed—Number of compressed packets. • Error—Number of error packets. • Total—Total number of received packets.
Sent: Compressed/Total Sent/Saved/Total Packet-based compression ratio Byte-based compression ratio	Statistics for sent packets: • Compressed—Number of compressed packets. • Total—Total number of sent packets. • Sent—Bytes of sent packets. • Saved—Bytes of saved packets. • Total—Total bytes to be sent if packets are not compressed. • Packet-based compression ratio—Ratio of compressed packets to the total sent packets. • Byte-based compression ratio—Ratio of saved bytes to the total sent bytes.
Connections: Rx/Tx Five-Minute-Miss Max-Miss	Number of connections. • Rx—Number of connections that the receiver can decompress. • Tx—Number of connections that the sender can compress. • Five-Minute-Miss—Number of search failures within the last 5 minutes. • Max-Miss—Maximum number of search failures within 5 minutes.

Related commands

```
ppp compression iphc enable
reset ppp compression iphc
```

display ppp packet statistics

Use **display ppp packet statistics** to display PPP negotiation packet statistics.

Syntax

```
display ppp packet statistics [ slot slot-number ]
```

Views

Any view

Predefined user roles

network-admin
network-operator

Parameters

slot slot-number: Specifies a card by its slot number. If you do not specify a card, this command displays PPP negotiation packet statistics for all cards.

Examples

Display PPP negotiation packet statistics for slot 1.

<Sysname> display ppp packet statistics slot 1

PPP packet statistics in slot 1:

```
-----LCP-----
SEND_LCP_CON_REQ      : 0          RECV_LCP_CON_REQ      : 0
SEND_LCP_CON_NAK      : 0          RECV_LCP_CON_NAK      : 0
SEND_LCP_CON_REJ      : 0          RECV_LCP_CON_REJ      : 0
SEND_LCP_CON_ACK      : 0          RECV_LCP_CON_ACK      : 0
SEND_LCP_CODE_REJ     : 0          RECV_LCP_CODE_REJ     : 0
SEND_LCP_PROT_REJ     : 0          RECV_LCP_PROT_REJ     : 0
SEND_LCP_TERM_REQ     : 0          RECV_LCP_TERM_REQ     : 0
SEND_LCP_TERM_ACK     : 0          RECV_LCP_TERM_ACK     : 0
SEND_LCP_ECHO_REQ     : 0          RECV_LCP_ECHO_REQ     : 0
SEND_LCP_ECHO_REP     : 0          RECV_LCP_ECHO_REP     : 0
SEND_LCP_FAIL         : 0

-----IPCP-----
SEND_IPCP_CON_REQ     : 0          RECV_IPCP_CON_REQ     : 0
SEND_IPCP_CON_NAK     : 0          RECV_IPCP_CON_NAK     : 0
SEND_IPCP_CON_REJ     : 0          RECV_IPCP_CON_REJ     : 0
SEND_IPCP_CON_ACK     : 0          RECV_IPCP_CON_ACK     : 0
SEND_IPCP_CODE_REJ    : 0          RECV_IPCP_CODE_REJ    : 0
SEND_IPCP_PROT_REJ    : 0          RECV_IPCP_PROT_REJ    : 0
SEND_IPCP_TERM_REQ    : 0          RECV_IPCP_TERM_REQ    : 0
SEND_IPCP_TERM_ACK    : 0          RECV_IPCP_TERM_ACK    : 0
SEND_IPCP_FAIL        : 0

-----IPV6CP-----
SEND_IPV6CP_CON_REQ   : 0          RECV_IPV6CP_CON_REQ   : 0
SEND_IPV6CP_CON_NAK   : 0          RECV_IPV6CP_CON_NAK   : 0
SEND_IPV6CP_CON_REJ   : 0          RECV_IPV6CP_CON_REJ   : 0
SEND_IPV6CP_CON_ACK   : 0          RECV_IPV6CP_CON_ACK   : 0
SEND_IPV6CP_CODE_REJ  : 0          RECV_IPV6CP_CODE_REJ  : 0
SEND_IPV6CP_PROT_REJ  : 0          RECV_IPV6CP_PROT_REJ  : 0
SEND_IPV6CP_TERM_REQ  : 0          RECV_IPV6CP_TERM_REQ  : 0
SEND_IPV6CP_TERM_ACK  : 0          RECV_IPV6CP_TERM_ACK  : 0
SEND_IPV6CP_FAIL      : 0

-----OSICP-----
SEND_OSICP_CON_REQ    : 0          RECV_OSICP_CON_REQ    : 0
SEND_OSICP_CON_NAK    : 0          RECV_OSICP_CON_NAK    : 0
SEND_OSICP_CON_REJ    : 0          RECV_OSICP_CON_REJ    : 0
SEND_OSICP_CON_ACK    : 0          RECV_OSICP_CON_ACK    : 0
SEND_OSICP_CODE_REJ   : 0          RECV_OSICP_CODE_REJ   : 0
SEND_OSICP_PROT_REJ   : 0          RECV_OSICP_PROT_REJ   : 0
SEND_OSICP_TERM_REQ   : 0          RECV_OSICP_TERM_REQ   : 0
SEND_OSICP_TERM_ACK   : 0          RECV_OSICP_TERM_ACK   : 0
SEND_OSICP_FAIL       : 0

-----MPLSCP-----
SEND_MPLSCP_CON_REQ   : 0          RECV_MPLSCP_CON_REQ   : 0
```

```

SEND_MPLSCP_CON_NAK      : 0          RECV_MPLSCP_CON_NAK      : 0
SEND_MPLSCP_CON_REJ      : 0          RECV_MPLSCP_CON_REJ      : 0
SEND_MPLSCP_CON_ACK      : 0          RECV_MPLSCP_CON_ACK      : 0
SEND_MPLSCP_CODE_REJ     : 0          RECV_MPLSCP_CODE_REJ     : 0
SEND_MPLSCP_PROT_REJ     : 0          RECV_MPLSCP_PROT_REJ     : 0
SEND_MPLSCP_TERM_REQ     : 0          RECV_MPLSCP_TERM_REQ     : 0
SEND_MPLSCP_TERM_ACK     : 0          RECV_MPLSCP_TERM_ACK     : 0
SEND_MPLSCP_FAIL         : 0
-----AUTH-----
SEND_PAP_AUTH_REQ        : 0          RECV_PAP_AUTH_REQ        : 0
SEND_PAP_AUTH_ACK        : 0          RECV_PAP_AUTH_ACK        : 0
SEND_PAP_AUTH_NAK        : 0          RECV_PAP_AUTH_NAK        : 0
SEND_CHAP_AUTH_CHALLENGE : 0          RECV_CHAP_AUTH_CHALLENGE : 0
SEND_CHAP_AUTH_RESPONSE  : 0          RECV_CHAP_AUTH_RESPONSE  : 0
SEND_CHAP_AUTH_ACK       : 0          RECV_CHAP_AUTH_ACK       : 0
SEND_CHAP_AUTH_NAK       : 0          RECV_CHAP_AUTH_NAK       : 0
SEND_PAP_AUTH_FAIL       : 0          SEND_CHAP_AUTH_FAIL      : 0

```

Table 7 Command output

Field	Description
LCP	LCP packet statistics. • SEND_LCP_CON_REQ—Number of sent link configuration request packets. • RECV_LCP_CON_REQ—Number of received link configuration request packets. • SEND_LCP_CON_NAK—Number of sent link configuration NAK packets. • RECV_LCP_CON_NAK—Number of received link configuration NAK packets. • SEND_LCP_CON_REJ—Number of sent link configuration reject packets. • RECV_LCP_CON_REJ—Number of received link configuration reject packets. • SEND_LCP_CON_ACK—Number of sent link configuration ACK packets. • RECV_LCP_CON_ACK—Number of received link configuration ACK packets. • SEND_LCP_CODE_REJ—Number of sent link configuration code reject packets. • RECV_LCP_CODE_REJ—Number of received link configuration code reject packets. • SEND_LCP_PROT_REJ—Number of sent link configuration protocol reject packets. • RECV_LCP_PROT_REJ—Number of received link configuration protocol reject packets. • SEND_LCP_TERM_REQ—Number of sent link termination request packets. • RECV_LCP_TERM_REQ—Number of received link termination request packets. • SEND_LCP_TERM_ACK—Number of sent link termination ACK packets. • RECV_LCP_TERM_ACK—Number of received link termination ACK packets. • SEND_LCP_ECHO_REQ—Number of sent LCP echo request packets. • RECV_LCP_ECHO_REQ—Number of received LCP echo request packets. • SEND_LCP_ECHO_REP—Number of sent LCP echo reply packets. • RECV_LCP_ECHO_REP—Number of received LCP echo reply packets. • SEND_LCP_FAIL—Number of sent link failure packets.
IPCP	IPCP packet statistics. • SEND_IPCP_CON_REQ—Number of sent IP address negotiation request packets. • RECV_IPCP_CON_REQ—Number of received IP address negotiation request packets. • SEND_IPCP_CON_NAK—Number of sent IP address negotiation NAK packets. • RECV_IPCP_CON_NAK—Number of received IP address negotiation NAK packets. • SEND_IPCP_CON_REJ—Number of sent IP address negotiation reject packets. • RECV_IPCP_CON_REJ—Number of received IP address negotiation reject packets.

Field	Description
	• SEND_IPCP_CON_ACK—Number of sent IP address negotiation ACK packets. • RECV_IPCP_CON_ACK—Number of received IP address negotiation ACK packets. • SEND_IPCP_CODE_REJ—Number of sent IP address negotiation code reject packets. • RECV_IPCP_CODE_REJ—Number of received IP address negotiation code reject packets. • SEND_IPCP_PROT_REJ—Number of sent IP address negotiation protocol reject packets. • RECV_IPCP_PROT_REJ—Number of received IP address negotiation protocol reject packets. • SEND_IPCP_TERM_REQ—Number of sent IP address negotiation termination request packets. • RECV_IPCP_TERM_REQ—Number of received IP address negotiation termination request packets. • SEND_IPCP_TERM_ACK—Number of sent IP address negotiation termination ACK packets. • RECV_IPCP_TERM_ACK—Number of received IP address negotiation termination ACK packets. • SEND_IPCP_FAIL—Number of sent IP address negotiation failure packets.
IPv6CP	IPv6CP packet statistics. • SEND_IPV6CP_CON_REQ—Number of sent IPv6 address negotiation request packets. • RECV_IPV6CP_CON_REQ—Number of received IPv6 address negotiation request packets. • SEND_IPV6CP_CON_NAK—Number of sent IPv6 address negotiation NAK packets. • RECV_IPV6CP_CON_NAK—Number of received IPv6 address negotiation NAK packets. • SEND_IPV6CP_CON_REJ—Number of sent IPv6 address negotiation reject packets. • RECV_IPV6CP_CON_REJ—Number of received IPv6 address negotiation reject packets. • SEND_IPV6CP_CON_ACK—Number of sent IPv6 address negotiation ACK packets. • RECV_IPV6CP_CON_ACK—Number of received IPv6 address negotiation ACK packets. • SEND_IPV6CP_CODE_REJ—Number of sent IPv6 address negotiation code reject packets. • RECV_IPV6CP_CODE_REJ—Number of received IPv6 address negotiation code reject packets. • SEND_IPV6CP_PROT_REJ—Number of sent IPv6 address negotiation protocol reject packets. • RECV_IPV6CP_PROT_REJ—Number of received IPv6 address negotiation protocol reject packets. • SEND_IPV6CP_TERM_REQ—Number of sent IPv6 address negotiation termination request packets. • RECV_IPV6CP_TERM_REQ—Number of received IPv6 address negotiation termination request packets. • SEND_IPV6CP_TERM_ACK—Number of sent IPv6 address negotiation termination ACK packets. • RECV_IPV6CP_TERM_ACK—Number of received IPv6 address negotiation termination ACK packets. • SEND_IPV6CP_FAIL—Number of sent IPv6 address negotiation failure packets.
OSICP	OSICP packet statistics. • SEND_OSICP_CON_REQ—Number of sent OSI address negotiation request packets. • RECV_OSICP_CON_REQ—Number of received OSI address negotiation request packets.

Field	Description
	• SEND_OSICP_CON_NAK—Number of sent OSI address negotiation NAK packets. • RECV_OSICP_CON_NAK—Number of received OSI address negotiation NAK packets. • SEND_OSICP_CON_REJ—Number of sent OSI address negotiation reject packets. • RECV_OSICP_CON_REJ—Number of received OSI address negotiation reject packets. • SEND_OSICP_CON_ACK—Number of sent OSI address negotiation ACK packets. • RECV_OSICP_CON_ACK—Number of received OSI address negotiation ACK packets. • SEND_OSICP_CODE_REJ—Number of sent OSI address negotiation code reject packets. • RECV_OSICP_CODE_REJ—Number of received OSI address negotiation code reject packets. • SEND_OSICP_PROT_REJ—Number of sent OSI address negotiation protocol reject packets. • RECV_OSICP_PROT_REJ—Number of received OSI address negotiation protocol reject packets. • SEND_OSICP_TERM_REQ—Number of sent OSI address negotiation termination request packets. • RECV_OSICP_TERM_REQ—Number of received OSI address negotiation termination request packets. • SEND_OSICP_TERM_ACK—Number of sent OSI address negotiation termination ACK packets. • RECV_OSICP_TERM_ACK—Number of received OSI address negotiation termination ACK packets. • SEND_OSICP_FAIL—Number of sent OSI address negotiation failure packets.
MPLSCP	MPLSCP packet statistics. • SEND_MPLSCP_CON_REQ—Number of sent MPLS address negotiation request packets. • RECV_MPLSCP_CON_REQ—Number of received MPLS address negotiation request packets. • SEND_MPLSCP_CON_NAK—Number of sent MPLS address negotiation NAK packets. • RECV_MPLSCP_CON_NAK—Number of received MPLS address negotiation NAK packets. • SEND_MPLSCP_CON_REJ—Number of sent MPLS address negotiation reject packets. • RECV_MPLSCP_CON_REJ—Number of received MPLS address negotiation reject packets. • SEND_MPLSCP_CON_ACK—Number of sent MPLS address negotiation ACK packets. • RECV_MPLSCP_CON_ACK—Number of received MPLS address negotiation ACK packets. • SEND_MPLSCP_CODE_REJ—Number of sent MPLS address negotiation code reject packets. • RECV_MPLSCP_CODE_REJ—Number of received MPLS address negotiation code reject packets. • SEND_MPLSCP_PROT_REJ—Number of sent MPLS address negotiation protocol reject packets. • RECV_MPLSCP_PROT_REJ—Number of received MPLS address negotiation protocol reject packets. • SEND_MPLSCP_TERM_REQ—Number of sent MPLS address negotiation termination request packets. • RECV_MPLSCP_TERM_REQ—Number of received MPLS address negotiation termination request packets.

Field	Description
	• SEND_MPLSCP_TERM_ACK—Number of sent MPLS address negotiation termination ACK packets. • RECV_MPLSCP_TERM_ACK—Number of received MPLS address negotiation termination ACK packets. • SEND_MPLSCP_FAIL—Number of sent MPLS address negotiation failure packets.
AUTH	Authentication packet statistics. • SEND_PAP_AUTH_REQ—Number of sent PAP authentication request packets. • RECV_PAP_AUTH_REQ—Number of received PAP authentication request packets. • SEND_PAP_AUTH_ACK—Number of sent PAP authentication ACK packets. • RECV_PAP_AUTH_ACK—Number of received PAP authentication ACK packets. • SEND_PAP_AUTH_NAK—Number of sent PAP authentication NAK packets. • RECV_PAP_AUTH_NAK—Number of received PAP authentication NAK packets. • SEND_CHAP_AUTH_CHALLENGE—Number of sent CHAP authentication request packets. • RECV_CHAP_AUTH_CHALLENGE—Number of received CHAP authentication request packets. • SEND_CHAP_AUTH_RESPONSE—Number of sent CHAP authentication response packets. • RECV_CHAP_AUTH_RESPONSE—Number of received CHAP authentication response packets. • SEND_CHAP_AUTH_ACK—Number of sent CHAP authentication ACK packets. • RECV_CHAP_AUTH_ACK—Number of received CHAP authentication ACK packets. • SEND_CHAP_AUTH_NAK—Number of sent CHAP authentication NAK packets. • RECV_CHAP_AUTH_NAK—Number of received CHAP authentication NAK packets. • SEND_PAP_AUTH_FAIL—Number of sent PAP authentication failure packets. • SEND_CHAP_AUTH_FAIL—Number of sent CHAP authentication failure packets.

Related commands

reset ppp packet statistics

interface virtual-template

Use **interface virtual-template** to create a VT interface and enter its view, or enter the view of an existing VT interface.

Use **undo interface virtual-template** to remove a VT interface.

Syntax

interface virtual-template *number*

undo interface virtual-template *number*

Default

No VT interfaces exist.

Views

System view

Predefined user roles

network-admin

Parameters

number: Specifies a VT interface by its number. The value range for this argument is 0 to 1023.

Usage guidelines

To remove a VT interface, make sure all the corresponding VA interfaces are removed and the VT interface is not in use.

Examples

```
# Create interface Virtual-Template 10.  
<Sysname> system-view  
[Sysname] interface virtual-template 10  
[Sysname-Virtual-Template10]
```

ip address ppp-negotiate

Use **ip address ppp-negotiate** to enable IP address negotiation on an interface, so that the interface can accept the IP address allocated by the server.

Use **undo ip address ppp-negotiate** to restore the default.

Syntax

```
ip address ppp-negotiate  
undo ip address ppp-negotiate
```

Default

IP address negotiation is disabled on an interface.

Views

Interface view

Predefined user roles

network-admin

Usage guidelines

If you execute the **ip address ppp-negotiate** and **ip address** commands multiple times, the most recent configuration takes effect.

Examples

```
# Enable IP address negotiation on Serial 0/2/0.  
<Sysname> system-view  
[Sysname] interface serial 0/2/0  
[Sysname-Serial0/2/0] ip address ppp-negotiate  
  
# Enable IP address negotiation on Virtual-Template 1.  
<Sysname> system-view  
[Sysname] interface virtual-template 1  
[Sysname-Virtual-Template1] ip address ppp-negotiate
```

Related commands

```
ip address (Layer 3—IP Services Command Reference)  
remote address
```

ip pool

Use **ip pool** to configure a PPP address pool.

Use **undo ip pool** to remove a PPP address pool or an IP address range of the PPP address pool.

Syntax

```
ip pool pool-name start-ip-address [ end-ip-address ] [ group group-name ]  
undo ip pool pool-name [ start-ip-address [ end-ip-address ] ]
```

Default

No PPP address pool is configured.

Views

System view

Predefined user roles

network-admin

Parameters

pool-name: Specifies a name for the PPP address pool to be created, a case-sensitive string of 1 to 31 characters.

start-ip-address [*end-ip-address*]: Specifies an IP address range. If you do not specify the *end-ip-address* argument, the PPP address pool has only the start IP address.

group *group-name*: Specifies a group by its name to which the PPP address pool belongs. The group name is a case-sensitive string of 1 to 31 characters. If you do not specify this option, the group name is **default** (the default group).

Usage guidelines

The system supports multiple address spaces that each correspond to a VPN instance. The same IP addresses can exist in different address spaces.

Each address space is represented by a group. One group can contain multiple PPP address pools, but one PPP address pool can belong to only one group.

One PPP address pool can contain multiple IP address ranges. You can execute this command multiple times to specify multiple IP address ranges for a PPP address pool. A PPP address pool can contain a maximum of 65535 IP addresses, and so can an IP address range.

IP address ranges in different groups can be overlapping, but those in the same group cannot.

Changes to a PPP address pool do not affect assigned IP addresses. For example, if you delete a PPP address pool from which an IP address has been assigned, the IP address can still be used.

When assigning IP address to users through a PPP address pool, make sure the PPP address pool excludes the gateway IP address of the PPP address pool.

Examples

Configure PPP address pool **aaa** that contains IP addresses 129.102.0.1 through 129.102.0.10 for group **a**.

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

```
[Sysname] ip pool aaa 129.102.0.1 129.102.0.10 group a
```

Related commands

```
display ip pool
```

ip pool gateway

Use **ip pool gateway** to configure a gateway address for a PPP address pool.

Use **undo ip pool gateway** to remove the gateway address for the specified PPP address pool.

Syntax

```
ip pool pool-name gateway ip-address [ vpn-instance vpn-instance-name ]  
undo ip pool pool-name gateway
```

Default

A PPP address pool is not configured with a gateway address.

Views

System view

Predefined user roles

network-admin

Parameters

pool-name: Specifies an existing PPP address pool by its name, a case-sensitive string of 1 to 31 characters.

ip-address: Specifies a gateway address for the PPP address pool.

vpn-instance *vpn-instance-name*: Specifies an existing MPLS L3VPN instance by its name, a case-sensitive string of 1 to 31 characters. If you do not specify this option, the specified gateway belongs to the public network.

Usage guidelines

An interface on a BRAS must have an IP address before it can assign an IP address from a PPP or DHCP address pool to a client. This command enables interfaces that have no IP address to use a gateway address for IPCP negotiation and address allocation.

When you configure a gateway address for a PPP address pool, follow these restrictions and guidelines:

- If you also specify an IP address for an interface, the interface uses its own IP address to perform IPCP negotiation.
- You can specify only one gateway address for a PPP address pool. Different PPP address pools must have different gateway addresses (different combinations of *ip-address* and *vpn-instance-name*).
- You can specify any gateway address for a PPP address pool.

Examples

```
# Specify gateway address 1.1.1.1 for PPP address pool aaa.  
<Sysname> system-view  
[Sysname] ip pool aaa gateway 1.1.1.1
```

Related commands

ip pool

link-protocol ppp

Use **link-protocol ppp** to enable PPP encapsulation on an interface.

Syntax

```
link-protocol ppp
```

Default

PPP encapsulation is enabled on all interfaces except Ethernet, VLAN, and ATM interfaces.

Views

Interface view

Predefined user roles

network-admin

Examples

```
# Enable PPP encapsulation on Serial 0/2/0.
<Sysname> system-view
[Sysname] interface serial 0/2/0
[Sysname-Serial0/2/0] link-protocol ppp
```

mtu

Use **mtu** to set the MTU size of an interface.

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

Syntax

```
mtu size
undo mtu
```

Default

The MTU size is 1500.

Views

VT interface view

MP-group interface view

Predefined user roles

network-admin

Parameters

size: Specifies the MTU size. The value range for this argument is 128 to 1500.

Usage guidelines

The MTU size setting of an interface affects the fragmentation and reassembly of IP packets on that interface.

For the configured MTU size to take effect, you must execute the **shutdown** command and then the **undo shutdown** command on the interface.

Examples

```
# Set the MTU size of Virtual-Template 10 to 1400 bytes.
<Sysname> system-view
[Sysname] interface virtual-template 10
[Sysname-Virtual-Template10] mtu 1400

# Set the MTU size of MP-group 0/0/1 to 1200 bytes.
<Sysname> system-view
[Sysname] interface mp-group 0/0/1
[Sysname-MP-group0/0/1] mtu 1200
```

nas-port-type

Use **nas-port-type** to configure the NAS-Port-Type attribute on a VT interface.

Use **undo nas-port-type** to restore the default.

Syntax

nas-port-type { **802.11** | **adsl-cap** | **adsl-dmt** | **async** | **cable** | **ethernet** | **g.3-fax** | **hdlc** | **idsl** | **isdn-async-v110** | **isdn-async-v120** | **isdn-sync** | **piafs** | **sdsl** | **sync** | **virtual** | **wireless-other** | **x.25** | **x.75** | **xdsl** }

undo nas-port-type

Default

The NAS-Port-Type attribute is determined by the service type and link type of the PPP user, as shown in [Table 8](#).

Table 8 Default NAS-Port-Type attribute

Service type	NAS-Port-Type attribute
PPPoE	xdsl
	Ethernet
L2TP	virtual

Views

VT interface view

Predefined user roles

network-admin

Parameters

802.11: Specifies IEEE 802.11. The code value is 19.

adsl-cap: Specifies asymmetric DSL, Carrierless Amplitude Phase. The code value is 12.

adsl-dmt: Specifies asymmetric DSL, Discrete Multi-Tone. The code value is 13.

async: Specifies async. The code value is 0.

cable: Specifies cable. The code value is 17.

ethernet: Specifies Ethernet. The code value is 15.

g.3-fax: Specifies G.3 Fax. The code value is 10.

hdlc: Specifies HDLC Clear Channel. The code value is 7.

idsl: Specifies ISDN Digital Subscriber Line. The code value is 14.

isdn-async-v110: Specifies ISDN Async V.110. The code value is 4.

isdn-async-v120: Specifies ISDN Async V.120. The code value is 3.

isdn-sync: Specifies ISDN Sync. The code value is 2.

piafs: Specifies PHS Internet Access Forum Standard. The code value is 6.

sdsl: Specifies symmetric DSL. The code value is 11.

sync: Specifies sync. The code value is 1.

virtual: Specifies virtual. The code value is 5.

wireless-other: Specifies wireless-other. The code value is 18.

x.25: Specifies X.25. The code value is 8.

x.75: Specifies X.75. The code value is 9.

xds1: Specifies Digital Subscriber Line of unknown type. The code value is 16.

Usage guidelines

The NAS-Port-Type attribute is used for RADIUS authentication and accounting. For more information about the NAS-Port-Type attribute, see RFC 2865.

This command does not affect existing users.

Examples

Set the NAS-Port-Type attribute to **sync** for Virtual-Template 1.

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

```
[Sysname] interface virtual-template 1
```

```
[Sysname-Virtual-Template1] nas-port-type sync
```

ppp accm

Use **ppp accm** to set the ACCM value sent to the peer on an interface.

Use **undo ppp accm** to restore the default.

Syntax

ppp accm *hex-number*

undo ppp accm

Default

The ACCM value sent to the peer is 0x000A0000 on an interface.

Views

Interface view

Predefined user roles

network-admin

Parameters

hex-number: Specifies an ACCM value in hexadecimal format, in the range of 0 to 0xFFFFFFFF.

Usage guidelines

ACCM negotiation only applies to asynchronous links.

Examples

Set the ACCM value sent to the peer to 0x01010101 on Serial 0/2/0.

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

```
[Sysname] interface serial 0/2/0
```

```
[Sysname-Serial0/2/0] ppp accm 01010101
```

ppp access-user log enable

Use **ppp access-user log enable** to enable PPP user logging.

Use **undo ppp access-user log enable** to disable PPP user logging.

Syntax

```
ppp access-user log enable [ abnormal-logout | failed-login |  
normal-logout | successful-login ] *  
undo ppp access-user log enable [ abnormal-logout | failed-login |  
normal-logout | successful-login ] *
```

Default

Logging is disabled for PPP users.

Views

System view

Predefined user roles

network-admin

Parameters

successful-login: Specifies login success logs.

failed-login: Specifies login failure logs.

normal-logout: Specifies normal logout logs.

abnormal-logout: Specifies abnormal logout logs.

Usage guidelines



IMPORTANT:

Typically, disable this feature to prevent excessive PPP log output.

The PPP user logging feature enables the device to generate PPP logs and send them to the information center. Logs are generated after a user comes online, goes offline, or fails to come online. A log entry contains information such as the username, IP address, interface name, inner VLAN, outer VLAN, MAC address, and failure causes. For information about the log destination and output rule configuration in the information center, see *Network Management and Monitoring Configuration Guide*.

When you execute this command without specifying any keyword, this command enables or disables logging for login successes, login failures, normal logouts, and abnormal logouts.

Examples

```
# Enable PPP user logging.  
<Sysname> system-view  
[Sysname] ppp access-user log enable
```

ppp account-statistics enable

Use **ppp account-statistics enable** to enable PPP accounting on an interface.

Use **undo ppp account-statistics enable** to disable PPP accounting on an interface.

Syntax

```
ppp account-statistics enable [ acl { acl-number | name acl-name } ]  
undo ppp account-statistics enable
```

Default

PPP accounting is disabled on an interface.

Views

Interface view

Predefined user roles

network-admin

Parameters

acl: Specifies an ACL to match traffic. If no ACL is specified, the device generates statistics for all PPP traffic.

acl-number: Specifies an ACL by its number in the range of 2000 to 3999, where:

- 2000 to 2999 are numbers for basic IPv4 and IPv6 ACLs.
- 3000 to 3999 are numbers for advanced IPv4 and IPv6 ACLs.

If the specified ACL number corresponds to an IPv4 ACL and an IPv6 ACL, both ACLs take effect.

name acl-name: Specifies an ACL by its name, a case-insensitive string of 1 to 63 characters that start with an alphabetical character. To avoid confusion, do not use **all** as an ACL name.

Usage guidelines

When specifying an ACL, follow these restrictions and guidelines:

- If the specified ACL does not exist or does not have any rules, the PPP accounting feature does not take effect.
- In a specified ACL, if a rule has the **vpn-instance** keyword specified, the rule takes effect only on VPN packets. If a rule does not have the **vpn-instance** keyword specified, the rule takes effect only on packets in the public network.

Examples

```
# Enable PPP accounting on Serial 0/2/0.
<Sysname> system-view
[Sysname] interface serial 0/2/0
[Sysname-Serial0/2/0] ppp account-statistics enable

# Enable PPP accounting on Virtual-Template 1.
<Sysname> system-view
[Sysname] interface virtual-template 1
[Sysname-Virtual-Template1] ppp account-statistics enable
```

ppp acfc local-request

Use **ppp acfc local-request** to configure an interface to send ACFC requests by including the ACFC option in outbound LCP negotiation requests.

Use **undo ppp acfc local-request** to restore the default.

Syntax

```
ppp acfc local-request
undo ppp acfc local-request
```

Default

An interface does not include the ACFC option in outbound LCP negotiation requests.

Views

Interface view

Predefined user roles

network-admin

Examples

```
# Configure Serial 0/2/0 to send ACFC requests to the peer in PPP negotiation.
<Sysname> system-view
[Sysname] interface serial 0/2/0
[Sysname-Serial0/2/0] ppp acfc local-request

# Configure Virtual-Template 1 to send ACFC requests to the peer in PPP negotiation.
<Sysname> system-view
[Sysname] interface virtual-template 1
[Sysname-Virtual-Template1] ppp acfc local-request
```

ppp acfc remote-reject

Use **ppp acfc remote-reject** to configure an interface to reject ACFC requests received from the remote peer.

Use **undo ppp acfc remote-reject** to restore the default.

Syntax

```
ppp acfc remote-reject
undo ppp acfc remote-reject
```

Default

An interface accepts ACFC requests received from the remote peer, and it performs ACFC on frames sent to the peer.

Views

Interface view

Predefined user roles

network-admin

Examples

```
# Configure Serial 0/2/0 to reject ACFC requests received from the remote peer.
<Sysname> system-view
[Sysname] interface serial 0/2/0
[Sysname-Serial0/2/0] ppp acfc remote-reject

# Configure Virtual-Template 1 to reject ACFC requests received from the remote peer.
<Sysname> system-view
[Sysname] interface virtual-template 1
[Sysname-Virtual-Template1] ppp acfc remote-reject
```

ppp authentication-mode

Use **ppp authentication-mode** to configure PPP authentication on an interface.

Use **undo ppp authentication-mode** to restore the default.

Syntax

```
ppp authentication-mode { chap | ms-chap | ms-chap-v2 | pap } * [ [ call-in ]  
domain { isp-name | default enable isp-name } ]  
undo ppp authentication-mode
```

Default

PPP authentication is disabled on an interface.

Views

Interface view

Predefined user roles

network-admin

Parameters

chap: Uses CHAP authentication.

ms-chap: Uses MS-CHAP authentication.

ms-chap-v2: Uses MS-CHAP-V2 authentication.

pap: Uses PAP authentication.

call-in: Authenticates the call-in users only. This keyword can be configured when the local end acts as the receiving end of DDR calls. For more information about DDR, see *Layer 2—WAN Access Configuration Guide*.

domain isp-name: Specifies the ISP domain name for authentication, a case-insensitive string of 1 to 255 characters. The ISP domain name cannot be **d**, **de**, **def**, **defa**, **defau**, **default**, or **default**.

default enable isp-name: Specifies the default ISP domain name for authentication, a case-insensitive string of 1 to 255 characters.

Usage guidelines

PPP authentication includes the following categories:

- **PAP**—Two-way handshake authentication. The password is in plain text or cipher text.
- **CHAP**—Three-way handshake authentication. The password is in plain text or cipher text.
- **MS-CHAP**—Three-way handshake authentication. The password is in cipher text.
- **MS-CHAP-V2**—Three-way handshake authentication. The password is in cipher text.

You can configure multiple authentication modes.

In any PPP authentication mode, AAA determines whether a user can pass the authentication through a local authentication database or an AAA server. For more information about AAA authentication, see *User Access and Authentication Configuration Guide*.

If multiple ISP domains are available, the ISP domains are used in the following order:

1. ISP domain specified by the **domain isp-name** option in this command.
2. ISP domain contained in the username.
3. ISP domain specified by the **domain default enable isp-name** option in this command.
4. ISP domain selected by using the AAA module. For more information about AAA, see *User Access and Authentication Configuration Guide*.

For authentication on a dialup interface, configure authentication on both the physical interface and the dialer interface. When a physical interface receives a DDR call request, it first initiates PPP negotiation and authenticates the dial-in user. Then it passes the call to the upper layer protocol.

Examples

```
# Configure Serial 0/2/0 to authenticate the peer by using PAP.
<Sysname> system-view
[Sysname] interface serial 0/2/0
[Sysname-Serial0/2/0] ppp authentication-mode pap

# Configure Serial 0/2/0 to authenticate the peer by using PAP, CHAP, and MS-CHAP.
<Sysname> system-view
[Sysname] interface serial 0/2/0
[Sysname-Serial0/2/0] ppp authentication-mode pap chap ms-chap

# Configure Virtual-Template 1 to authenticate the peer by using PAP.
<Sysname> system-view
[Sysname] interface virtual-template 1
[Sysname-Virtual-Template1] ppp authentication-mode pap

# Configure Virtual-Template 1 to authenticate the peer by using PAP and CHAP.
<Sysname> system-view
[Sysname] interface virtual-template 1
[Sysname-Virtual-Template1] ppp authentication-mode pap chap
```

Related commands

domain default (*User Access and Authentication Command Reference*)
local-user (*User Access and Authentication Command Reference*)
ppp chap password
ppp chap user
ppp pap local-user

ppp chap password

Use **ppp chap password** to set the password for CHAP authentication on an interface.

Use **undo ppp chap password** to restore the default.

Syntax

```
ppp chap password { cipher | simple } string  
undo ppp chap password
```

Default

No password is set for CHAP authentication on an interface.

Views

Interface view

Predefined user roles

network-admin

Parameters

cipher: Specifies a password in encrypted form.

simple: Specifies a password in plaintext form. For security purposes, the password specified in plaintext form will be stored in encrypted form.

string: Specifies the password. Its plaintext form is a case-sensitive string of 1 to 255 characters. Its encrypted form is a case-sensitive string of 1 to 373 characters.

Examples

Set the password for CHAP authentication to plaintext password **sysname** on Serial 0/2/0.

```
<Sysname> system-view
[Sysname] interface serial 0/2/0
[Sysname-Serial0/2/0] ppp chap password simple sysname
```

Set the password for CHAP authentication to plaintext password **sysname** on Virtual-Template 1.

```
<Sysname> system-view
[Sysname] interface virtual-template 1
[Sysname-Virtual-Template1] ppp chap password simple sysname
```

Related commands

ppp authentication-mode

ppp chap user

Use **ppp chap user** to set the username for CHAP authentication on an interface.

Use **undo ppp chap user** to restore the default.

Syntax

```
ppp chap user username
undo ppp chap user
```

Default

The username for CHAP authentication is null on an interface.

Views

Interface view

Predefined user roles

network-admin

Parameters

username: Specifies the username for CHAP authentication, a case-sensitive string of 1 to 80 characters. The username is sent to the peer for the local device to be authenticated.

Usage guidelines

To pass CHAP authentication, the username/password of one side must be the local username/password on the peer.

Examples

Set the username for CHAP authentication to **Root** on Serial 0/2/0.

```
<Sysname> system-view
[Sysname] interface serial 0/2/0
[Sysname-Serial0/2/0] ppp chap user Root
```

Set the username for CHAP authentication to **Root** on Virtual-Template 1.

```
<Sysname> system-view
[Sysname] interface virtual-template 1
[Sysname-Virtual-Template1] ppp chap user Root
```

Related commands

ppp authentication-mode

ppp compression iphc enable

Use **ppp compression iphc enable** to enable IPHC on an interface.

Use **undo ppp compression iphc enable** to disable IPHC on an interface.

Syntax

ppp compression iphc enable [nonstandard]

undo ppp compression iphc enable

Default

IPHC is disabled on an interface.

Views

Interface view

Predefined user roles

network-admin

Parameters

nonstandard: Specifies the nonstandard encapsulation format. If you do not specify this keyword, packets are encapsulated in standard format. You must specify this keyword when the device communicates with a non-H3C device. If you specify this keyword, this command enables RTP header compression.

Usage guidelines

IPHC includes RTP header compression and TCP header compression.

Enabling or disabling IPHC enables or disables both RTP header compression and TCP header compression.

To use IPHC, you must enable it on both sides of a PPP link.

When you enable IPHC on a VT, dialer, or ISDN interface, the setting does not immediately take effect. For the setting to take effect, execute the **shutdown** and then **undo shutdown** commands on the interface or its bound physical interface.

Examples

Enable IPHC on Serial 0/2/0.

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

```
[Sysname] interface serial 0/2/0
```

```
[Sysname-Serial0/2/0] ppp compression iphc enable
```

Enable IPHC on Virtual-Template 1.

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

```
[Sysname] interface virtual-template 1
```

```
[Sysname-Virtual-Template1] ppp compression iphc enable
```

ppp compression iphc rtp-connections

Use **ppp compression iphc rtp-connections** to set the maximum number of connections for which an interface can perform RTP header compression.

Use **undo ppp compression iphc rtp-connections** to restore the default.

Syntax

```
ppp compression iphc rtp-connections number  
undo ppp compression iphc rtp-connections
```

Default

An interface can perform RTP header compression for a maximum of 16 connections.

Views

Interface view

Predefined user roles

network-admin

Parameters

number: Specifies the maximum number of connections for which an interface can perform RTP header compression. The value range for this argument is 3 to 1000:

- When the *number* argument is set to a value less than or equal to 256, packets are compressed in the format of COMPRESSED RTP 8.
- When the *number* argument is set to a value greater than 256, packets are compressed in the format of COMPRESSED RTP 16.

Usage guidelines

RTP is a connection-oriented protocol. An interface can accommodate multiple RTP connections.

RTP header compression occupies memory resources for maintaining connection information. This command can limit memory resources used by compression. For example, if you set the limit to 3, RTP header compression only applies to a maximum of three RTP connections.

After you execute this command, you must shut down and then bring up the interface to make the command take effect.

You can execute this command only when IPHC is enabled. The configuration is removed after IPHC is disabled.

Examples

```
# Set the maximum number of connections for which Serial 0/2/0 can perform RTP header  
compression to 10.  
<Sysname> system-view  
[Sysname] interface serial 0/2/0  
[Sysname-Serial0/2/0] ppp compression iphc enable  
[Sysname-Serial0/2/0] ppp compression iphc rtp-connections 10  
  
# Set the maximum number of connections for which Virtual-Template 1 can perform RTP header  
compression to 10.  
<Sysname> system-view  
[Sysname] interface virtual-template 1  
[Sysname-Virtual-Template1] ppp compression iphc enable  
[Sysname-Virtual-Template1] ppp compression iphc rtp-connections 10
```

Related commands

```
ppp compression iphc enable
```

ppp compression iphc tcp-connections

Use **ppp compression iphc tcp-connections** to set the maximum number of connections for which an interface can perform TCP header compression.

Use **undo ppp compression iphc tcp-connections** to restore the default.

Syntax

```
ppp compression iphc tcp-connections number  
undo ppp compression iphc tcp-connections
```

Default

An interface can perform TCP header compression for a maximum of 16 connections.

Views

Interface view

Predefined user roles

network-admin

Parameters

number: Specifies the maximum number of connections for which an interface can perform TCP header compression. The value range for this argument is 3 to 256.

Usage guidelines

TCP is a connection-oriented protocol. A link can accommodate multiple TCP connections.

TCP header compression occupies memory resources for maintaining connection information. This command can limit memory resources used by compression. For example, if you set the limit to 3, TCP header compression only applies to a maximum of three TCP connections.

After you execute this command, you must shut down and then bring up the interface to make the command take effect.

You can execute this command only when IPHC is enabled and packets are encapsulated in standard format. The configuration is removed after IPHC is disabled or packets are encapsulated in nonstandard format.

Examples

Set the maximum number of connections for which Serial 0/2/0 can perform TCP header compression to 10.

```
<Sysname> system-view  
[Sysname] interface serial 0/2/0  
[Sysname-Serial0/2/0] ppp compression iphc enable  
[Sysname-Serial0/2/0] ppp compression iphc tcp-connections 10
```

Set the maximum number of connections for which Virtual-Template 1 can perform TCP header compression to 10.

```
<Sysname> system-view  
[Sysname] interface virtual-template 1  
[Sysname-Virtual-Template1] ppp compression iphc enable  
[Sysname-Virtual-Template1] ppp compression iphc tcp-connections 10
```

Related commands

```
ppp compression iphc enable
```

ppp ipcp dns

Use **ppp ipcp dns** to configure the primary and secondary DNS server IP addresses to be allocated in PPP negotiation on an interface.

Use **undo ppp ipcp dns** to delete the primary and secondary DNS server IP addresses to be allocated in PPP negotiation on an interface.

Syntax

```
ppp ipcp dns primary-dns-address [ secondary-dns-address ]  
undo ppp ipcp dns primary-dns-address [ secondary-dns-address ]
```

Default

The DNS server IP addresses to be allocated in PPP negotiation are not configured on an interface.

Views

Interface view

Predefined user roles

network-admin

Parameters

primary-dns-address: Specifies a primary DNS server IP address.

secondary-dns-address: Specifies a secondary DNS server IP address.

Usage guidelines

A device can assign DNS server IP addresses to its peer during PPP negotiation when the peer initiates requests.

To check the allocated DNS server IP addresses, execute the **winipcfg** or **ipconfig /all** command on the host.

Examples

```
# Set the primary and secondary DNS server IP addresses to 100.1.1.1 and 100.1.1.2 for the peer on  
Serial 0/2/0.
```

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

```
[Sysname] interface serial 0/2/0
```

```
[Sysname-Serial0/2/0] ppp ipcp dns 100.1.1.1 100.1.1.2
```

```
# Set the primary and secondary DNS server IP addresses to 100.1.1.1 and 100.1.1.2 for the peer on  
Virtual-Template 1.
```

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

```
[Sysname] interface virtual-template 1
```

```
[Sysname-Virtual-Template1] ppp ipcp dns 100.1.1.1 100.1.1.2
```

ppp ipcp dns admit-any

Use **ppp ipcp dns admit-any** to configure an interface to accept the DNS server IP addresses assigned by the peer even though it does not request DNS server IP addresses from the peer.

Use **undo ppp ipcp dns admit-any** to restore the default.

Syntax

```
ppp ipcp dns admit-any  
undo ppp ipcp dns admit-any
```

Default

An interface does not accept the DNS server IP addresses assigned by the peer if it does not request DNS server IP addresses from the peer.

Views

Interface view

Predefined user roles

network-admin

Usage guidelines

You can configure an interface to accept the DNS server IP addresses assigned by the peer, through which domain names can be resolved for the device.

Typically, the server assigns a DNS server address to a client in PPP negotiation only when the client is configured with the **ppp ipcp dns request** command. Some servers, however, forcibly assign DNS server addresses to clients. You must execute the **ppp ipcp dns admit-any** command on the client devices to accept the DNS server addresses.

Examples

```
# Configure Serial 0/2/0 to accept DNS server IP addresses allocated by the peer.
<Sysname> system-view
[Sysname] interface serial 0/2/0
[Sysname-Serial0/2/0] ppp ipcp dns admit-any

# Configure Virtual-Template 1 to accept DNS server IP addresses allocated by the peer.
<Sysname> system-view
[Sysname] interface virtual-template 1
[Sysname-Virtual-Template1] ppp ipcp dns admit-any
```

Related commands

ppp ipcp dns request

ppp ipcp dns request

Use **ppp ipcp dns request** to enable an interface to actively request the DNS server IP address from its peer.

Use **undo ppp ipcp dns request** to restore the default.

Syntax

```
ppp ipcp dns request
undo ppp ipcp dns request
```

Default

An interface does not actively request the DNS server IP address from its peer.

Views

Interface view

Predefined user roles

network-admin

Usage guidelines

If a device is connected to a provider's access server through a PPP link, you can use this command. Then, the device can obtain the specified DNS server IP address from the access server during IPCP negotiation.

You can check the DNS server IP addresses by displaying information about the interface.

Examples

```
# Enable Serial 0/2/0 to actively request the DNS server IP address from its peer.
<Sysname> system-view
[Sysname] interface serial 0/2/0
[Sysname-Serial0/2/0] ppp ipcp dns request

# Enable Virtual-Template 1 to actively request the DNS server IP address from its peer.
<Sysname> system-view
[Sysname] interface virtual-template 1
[Sysname-Virtual-Template1] ppp ipcp dns request
```

ppp ipcp remote-address match

Use **ppp ipcp remote-address match** to enable the IP segment match feature for PPP IPCP negotiation on an interface.

Use **undo ppp ipcp remote-address match** to restore the default.

Syntax

```
ppp ipcp remote-address match
undo ppp ipcp remote-address match
```

Default

The IP segment match feature is disabled for PPP IPCP negotiation on an interface.

Views

Interface view

Predefined user roles

network-admin

Usage guidelines

This command enables the local interface to check whether its IP address and the IP address of the remote interface are in the same network segment. If they are not, IPCP negotiation fails.

Examples

```
# Enable the IP segment match feature on Virtual-Template 1.
<Sysname> system-view
[Sysname] interface virtual-template 1
[Sysname-Virtual-Template1] ppp ipcp remote-address match
```

ppp ip-pool route

Use **ppp ip-pool route** to configure a PPP address pool route.

Use **undo ppp ip-pool route** to remove a PPP address pool route.

Syntax

```
ppp ip-pool route ip-address { mask-length | mask } [ vpn-instance vpn-instance-name ]  
undo ppp ip-pool route ip-address { mask-length | mask } [ vpn-instance vpn-instance-name ]
```

Default

No PPP address pool route is configured.

Views

System view

Predefined user roles

network-admin

Parameters

ip-address: Specifies the destination IP address of the PPP address pool route, in dotted decimal notation.

mask-length: Specifies a mask length for the IP address, in the range of 0 to 32.

mask: Specifies a mask for the IP address, in dotted decimal notation.

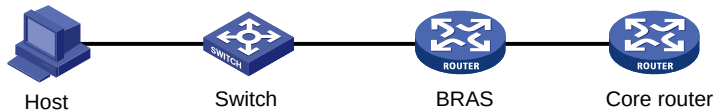
vpn-instance *vpn-instance-name*: Specifies an MPLS L3VPN instance by its name, a case-sensitive string of 1 to 31 characters. If you do not specify this option, the PPP address pool route applies to the public network.

Usage guidelines

The BRAS uses PPP address pool routes to control downlink traffic forwarding.

After you configure a PPP address pool route, the BRAS generates a static blackhole route destined for the specified network. All traffic matching the blackhole route is discarded. When a legal user logs in, the BRAS adds a host route destined for the specified network. In addition, the BRAS uses a dynamic routing protocol to redistribute the PPP address pool route to the upstream device.

Figure 1 Network diagram for the PPP address pool route



Make sure the destination network of the PPP address pool route includes the PPP address pool. You can execute this command multiple times to configure multiple PPP address pool routes.

Examples

```
# Configure the PPP address pool route as 2.2.2.2/24.  
<Sysname> system-view  
[Sysname] ppp ip-pool route 2.2.2.2 24
```

ppp lcp delay

Use **ppp lcp delay** to set the LCP negotiation delay timer.

Use **undo ppp lcp delay** to restore the default.

Syntax

```
ppp lcp delay milliseconds
```

undo ppp lcp delay

Default

PPP starts LCP negotiation immediately after the physical layer comes up.

Views

Interface view

Predefined user roles

network-admin

Parameters

milliseconds: Specifies the LCP negotiation delay timer in the range of 1 to 10000 milliseconds.

Usage guidelines

If two ends of a PPP link vary greatly in the LCP negotiation packet processing rate, execute this command on the end with a higher processing rate. The LCP negotiation delay timer prevents frequent LCP negotiation packet retransmission. After the physical layer comes up, PPP starts LCP negotiation when the delay timer expires. If PPP receives LCP negotiation packets before the delay timer expires, it starts LCP negotiation immediately.

Examples

```
# Set the LCP negotiation delay timer to 130 milliseconds.
<Sysname> system-view
[Sysname] interface virtual-template 1
[Sysname-Virtual-Template1] ppp lcp delay 130
```

ppp lqm

Use **ppp lqm** to enable PPP link quality Monitoring (LQM) on an interface.

Use **undo ppp lqm** to disable PPP LQM on an interface.

Syntax

```
ppp lqm close-percentage close-percentage [resume-percentage
resume-percentage ]
undo ppp lqm
```

Default

PPP LQM is disabled on an interface.

Views

Interface view

Predefined user roles

network-admin

Parameters

close-percentage *close-percentage*: Specifies the PPP LQM close percentage in the range of 0 to 100.

resume-percentage *resume-percentage*: Specifies the PPP LQM resume percentage in the range of 0 to 100. The resume percentage must be greater than or equal to the close percentage. The default resume percentage is equal to the close percentage.

Usage guidelines

If you enable PPP LQM on both sides of a PPP link, make sure both sides have the same PPP LQM settings. Typically, there is no need to enable PPP LQM on both sides of a PPP link.

As a best practice, do not enable PPP LQM on a DDR dial-up link because DDR tears the link down when the link is closed by LQM. Then LQM cannot send LQR packets to resume the link.

This command does not affect existing users.

Examples

```
# Enable PPP LQM on Serial 0/2/0, and set the PPP LQM close percentage to 90 and resume percentage to 95.
```

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

```
[Sysname] interface serial 0/2/0
```

```
[Sysname-Serial0/2/0] ppp lqm close-percentage 90 resume-percentage 95
```

ppp lqm lcp-echo

Use **ppp lqm lcp-echo** to configure an interface to periodically send LCP echo packets when LQM detects a low quality link.

Use **undo ppp lqm lcp-echo** to restore the default.

Syntax

ppp lqm lcp-echo [*packet size*] [*interval interval*]

undo ppp lqm lcp-echo

Default

An interface does not send LCP echo packets when LQM detects a low quality link.

Views

Interface view

Predefined user roles

network-admin

Parameters

packet size: Specifies the size added for the LCP echo packet, in the range of 128 to 1500 bytes. The default value is 0 bytes. For example, if you set the size argument to 1400, the LCP echo packet sent is 1400 bytes larger than the original length.

interval interval: Specifies the interval for sending LCP echo packets, in the range of 1 to 10 seconds. The default value is 10 seconds.

Usage guidelines

This feature can avoid PPP link flapping caused by loss of large LCP packets.

Examples

```
# Configure Serial 0/2/0 to send a LCP echo packet every 1 second. The LCP echo packet is 1400 bytes larger than the original length.
```

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

```
[Sysname] interface serial 0/2/0
```

```
[Sysname-Serial0/2/0] ppp lqm lcp-echo packet 1400 interval 1
```

ppp pap local-user

Use **ppp pap local-user** to set the local username and password for PAP authentication on an interface.

Use **undo ppp pap local-user** to restore the default.

Syntax

```
ppp pap local-user username password { cipher | simple } string
undo ppp pap local-user
```

Default

The local username and password for PAP authentication are blank on an interface.

Views

Interface view

Predefined user roles

network-admin

Parameters

username: Specifies the username of the local device for PAP authentication, a case-sensitive string of 1 to 80 characters.

cipher: Specifies a password in encrypted form.

simple: Specifies a password in plaintext form. For security purposes, the password specified in plaintext form will be stored in encrypted form.

string: Specifies the password. Its plaintext form is a case-sensitive string of 1 to 255 characters. Its encrypted form is a case-sensitive string of 1 to 373 characters.

Usage guidelines

For the local device to pass PAP authentication on the peer, make sure the username and password configured for the local device are also configured on the peer. You can configure the peer's username and password by using the **local-user username** and **password { cipher | simple } string** commands, respectively.

Examples

Set the local username and password for PAP authentication to **user1** and plaintext **pass1** on Serial 0/2/0.

```
<Sysname> system-view
[Sysname] interface serial 0/2/0
[Sysname-Serial0/2/0] ppp pap local-user user1 password simple pass1
```

Set the local username and password for PAP authentication to **user1** and plaintext **pass1** on Virtual-Template 1.

```
<Sysname> system-view
[Sysname] interface virtual-template 1
[Sysname-Virtual-Template1] ppp pap local-user user1 password simple pass1
```

Related commands

local-user (*User Access and Authentication Command Reference*)

password (*User Access and Authentication Command Reference*)

ppp pfc local-request

Use **ppp pfc local-request** to configure an interface to send PFC requests by including the PFC option in outbound LCP negotiation requests.

Use **undo ppp pfc local** to restore the default.

Syntax

```
ppp pfc local-request  
undo ppp pfc local-request
```

Default

An interface does not include the PFC option in outbound LCP negotiation requests.

Views

Interface view

Predefined user roles

network-admin

Examples

```
# Configure Serial 0/2/0 to send PFC requests during PPP negotiation.  
<Sysname> system-view  
[Sysname] interface serial 0/2/0  
[Sysname-Serial0/2/0] ppp pfc local-request  
  
# Configure Virtual-Template 1 to send PFC requests during PPP negotiation.  
<Sysname> system-view  
[Sysname] interface virtual-template 1  
[Sysname-Virtual-Template1] ppp pfc local-request
```

ppp pfc remote-reject

Use **ppp pfc remote-reject** to configure an interface to reject PFC requests received from the remote peer.

Use **undo ppp pfc remote** to restore the default.

Syntax

```
ppp pfc remote-reject  
undo ppp pfc remote-reject
```

Default

An interface accepts PFC requests received from the remote peer, and it performs PFC on frames sent to the peer.

Views

Interface view

Predefined user roles

network-admin

Examples

```
# Configure Serial 0/2/0 to reject PFC requests received from the remote peer.  
<Sysname> system-view
```

```
[Sysname] interface serial 0/2/0
[Sysname-Serial0/2/0] ppp pfc remote-reject
# Configure Virtual-Template 1 to reject PFC requests received from the remote peer.
<Sysname> system-view
[Sysname] interface virtual-template 1
[Sysname-Virtual-Template1] ppp pfc remote-reject
```

ppp timer negotiate

Use **ppp timer negotiate** to set the PPP negotiation timeout time on an interface.

Use **undo ppp timer negotiate** to restore the default.

Syntax

```
ppp timer negotiate seconds
undo ppp timer negotiate
```

Default

The PPP negotiation timeout time is 3 seconds on an interface.

Views

Interface view

Predefined user roles

network-admin

Parameters

seconds: Specifies the negotiation timeout time in the range of 1 to 10 seconds.

Usage guidelines

In PPP negotiation, if the local device receives no response from the peer during the timeout time after it sends a packet, the local device sends the last packet again.

Examples

```
# Set the PPP negotiation timeout time to 5 seconds on Serial 0/2/0.
<Sysname> system-view
[Sysname] interface serial 0/2/0
[Sysname-Serial0/2/0] ppp timer negotiate 5

# Set the PPP negotiation timeout time to 5 seconds on Virtual-Template 1.
<Sysname> system-view
[Sysname] interface virtual-template 1
[Sysname-Virtual-Template1] ppp timer negotiate 5
```

remote address

Use **remote address** to configure an interface to assign an IP address to the client.

Use **undo remote address** to restore the default.

Syntax

```
remote address { ip-address | pool pool-name }
undo remote address
```

Default

An interface does not assign an IP address to the client.

Views

Interface view

Predefined user roles

network-admin

Parameters

ip-address: Specifies the IP address to be assigned to the client.

pool *pool-name*: Specifies a PPP or DHCP address pool by its name from which an IP address is assigned to the client. The pool name is a case-sensitive string of 1 to 31 characters.

Usage guidelines

This command can be used when the local interface is configured with an IP address, but the peer has no IP address. To enable the peer to accept the IP address assigned by the local interface (server), you must execute the **ip address ppp-negotiate** command on the peer to make the peer act as a client.

This command enables the local interface to forcibly assign an IP address to the peer. If the peer is not configured with the **ip address ppp-negotiate** command but configured with an IP address, the peer will not accept the assigned IP address. This results in an IPCP negotiation failure.

PPP supports IP address assignment from a PPP or DHCP address pool, but the PPP address pool takes precedence over the DHCP address pool. For example, if you use a pool name that identifies both a PPP address pool and a DHCP address pool, the system uses only the PPP address pool for address assignment.

To make the configuration of the **remote address** command take effect, execute this command before the **ip address** command, which triggers IPCP negotiation. If you execute the **remote address** command after the **ip address** command, the server assigns an IP address to the client during the next IPCP negotiation.

After you use the **remote address** command to assign an IP address to the client, you can execute the **remote address** command again or the **undo remote address** command for the peer. However, the new configuration does not take effect until the next IPCP negotiation.

Examples

Specify the IP address to be assigned to the client as 10.0.0.1 on Serial 0/2/0.

```
<Sysname> system-view
[Sysname] interface serial 0/2/0
[Sysname-Serial0/2/0] remote address 10.0.0.1
```

Configure Serial 0/2/0 to assign an IP address from address pool **aaa** to the client.

```
<Sysname> system-view
[Sysname] interface serial 0/2/0
[Sysname-Serial0/2/0] remote address pool aaa
```

Specify the IP address to be assigned to the client as 10.0.0.1 on Virtual-Template 1.

```
<Sysname> system-view
[Sysname] interface virtual-template 1
[Sysname-Virtual-Template1] remote address 10.0.0.1
```

Configure Virtual-Template 1 to assign an IP address from address pool **aaa** to the client.

```
<Sysname> system-view
[Sysname] interface virtual-template 1
```

```
[Sysname-Virtual-Template1] remote address pool aaa
```

Related commands

ip address ppp-negotiate

ip pool

remote address dhcp client-identifier

Use **remote address dhcp client-identifier username** to configure the DHCP client IDs for PPP users acting as DHCP clients.

Use **undo remote address dhcp client-identifier** to restore the default.

Syntax

remote address dhcp client-identifier { callingnum | username }

undo remote address dhcp client-identifier

Default

No DHCP client IDs are configured for PPP users acting as DHCP clients.

Views

Interface view

Predefined user roles

network-admin

Parameters

callingnum: Uses the calling numbers as the DHCP client IDs. The calling numbers are carried in the calling number AVPs in L2TP negotiation packets. A calling number is formed by the user MAC address and the VLAN to which the user belongs. For example, if the MAC address of a user is 000f-e235-dc71, and the inner VLAN and outer VLAN of the user are VLAN 1 and VLAN 2, respectively, the calling number of the user is 000f-e235-dc71-00010002.

username: Uses the PPP usernames as the DHCP client IDs.

Usage guidelines

By default, a PPP client randomly selects a DHCP client ID when the PPP client requests an IP address through DHCP. In this case, the DHCP server cannot assign specific IP addresses to specific clients based on client IDs. For the DHCP server to assign specific IP addresses to specific clients based on client IDs, use this command to configure the calling numbers or usernames as the DHCP client IDs.

When PPP usernames are used as the DHCP client IDs, make sure different users use different PPP usernames to come online.

Examples

Use the PPP usernames as the DHCP client IDs for PPP users acting as DHCP clients on Serial 0/2/0.

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

```
[Sysname] interface serial 0/2/0
```

```
[Sysname-Serial0/2/0] remote address dhcp client-identifier username
```

Use the PPP usernames as the DHCP client IDs for PPP users acting as DHCP clients on Virtual-template 1.

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

```
[Sysname] interface virtual-template 1
```

[Sysname-Virtual-Template1] remote address dhcp client-identifier username

reset counters interface virtual-access

Use **reset counters interface virtual-access** to clear statistics on VA interfaces.

Syntax

```
reset counters interface [ virtual-access [ interface-number ] ]
```

Views

User view

Predefined user roles

network-admin

Parameters

virtual-access: Clears statistics on VA interfaces.

interface-number: Specifies an existing VA interface by its number.

Usage guidelines

Before collecting traffic statistics regularly on a VA interface, clear the existing statistics.

If you do not specify the **virtual-access** keyword, the command clears statistics on all interfaces.

If you specify the **virtual-access** keyword without the *interface-number* argument, the command clears statistics on all VA interfaces.

If you specify both **virtual-access** and *interface-number*, the command clears statistics on the specified VA interface.

Examples

```
# Clear statistics on Virtual-Access 10.
```

```
<Sysname> reset counters interface virtual-access 10
```

Related commands

display interface virtual-access

reset ppp access-user

Use **reset ppp access-user** to log off a PPP user.

Syntax

```
reset ppp access-user { ip-address ipv4-address [ vpn-instance  
ipv4-vpn-instance-name ] | ipv6-address ipv6-address [ vpn-instance  
ipv6-vpn-instance-name ] | username user-name }
```

Views

User view

Predefined user roles

network-admin

Parameters

ip-address *ipv4-address*: Specifies a PPP user by its IPv4 address.

ipv6-address *ipv6-address*: Specifies a PPP user by its IPv6 address.

vpn-instance *ipv4-vpn-instance-name*: Specifies a PPP user by the VPN to which the user belongs. The *ipv4-vpn-instance-name* argument specifies the name of the IPv4 MPLS L3VPN instance, a case-sensitive string of 1 to 31 characters. If you do not specify this option, the specified user belongs to the public network.

vpn-instance *ipv6-vpn-instance-name*: Specifies a PPP user by the VPN to which the user belongs. The *ipv6-vpn-instance-name* argument specifies the name of the IPv6 MPLS L3VPN instance, a case-sensitive string of 1 to 31 characters. If you do not specify this option, the specified user belongs to the public network.

username *user-name*: Specifies a PPP user by username, a case-sensitive string of 1 to 80 characters.

Usage guidelines

This command takes effect only on the current login for a PPP user. The user can come online after it is logged off.

Examples

```
# Log off the PPP user at 192.168.100.2.  
<Sysname> reset ppp access-user ip-address 192.168.100.2
```

Related commands

display ppp access-user

reset ppp compression iphc

Use **reset ppp compression iphc** to clear IPHC statistics.

Syntax

```
reset ppp compression iphc [ rtp | tcp ] [ interface interface-type  
interface-number ]
```

Views

User view

Predefined user roles

network-admin

Parameters

rtp: Clears IPHC RTP header compression statistics.

tcp: Clears IPHC TCP header compression statistics.

interface *interface-type interface-number*: Specifies an interface by its type and number. If you do not specify this option, the command clears IPHC statistics on all interfaces.

Usage guidelines

If neither **rtp** nor **tcp** is specified, this command clears both RTP header compression and TCP header compression statistics.

Examples

```
# Clear IPHC statistics on all interfaces.  
<Sysname> reset ppp compression iphc
```

Related commands

display ppp compression iphc

reset ppp packet statistics

Use **reset ppp packet statistics** to clear PPP negotiation packet statistics.

Syntax

reset ppp packet statistics [**slot** *slot-number*]

Views

User view

Predefined user roles

network-admin

Parameters

slot *slot-number*: Specifies a card by its slot number. If you do not specify a card, this command clears PPP negotiation packet statistics for all cards.

Examples

```
# Clear PPP negotiation packet statistics for slot 2.  
<Sysname> reset ppp packet statistics slot 2
```

Related commands

display ppp packet statistics

service

Use **service** to specify a primary traffic processing slot for an interface.

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

Syntax

service slot *slot-number*
undo service slot

Default

No primary traffic processing slot is specified for an interface.

Views

VT interface view

Predefined user roles

network-admin

Parameters

slot *slot-number*: Specifies a card by its slot number.

Usage guidelines

This command is supported on distributed devices and IRF-capable centralized devices.

Specify traffic processing slots if a feature requires that all traffic on a VA interface be processed on the same slot.

Examples

```
# Specify slot 2 as the primary traffic processing slot for the VA interfaces on Virtual-Template 10.  
<Sysname> system-view
```

```
[Sysname] interface virtual-template 10
[Sysname-Virtual-Template10] service slot 2
```

timer-hold

Use **timer-hold** to set the keepalive interval on an interface.

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

Syntax

timer-hold *seconds*

undo timer-hold

Default

The keepalive interval is 10 seconds on an interface.

Views

Interface view

Predefined user roles

network-admin

Parameters

seconds: Specifies the interval for sending keepalive packets, in the range of 0 to 32767 seconds. The value 0 disables an interface from sending keepalive packets. In this case, the interface can respond to keepalive packets from the peer.

Usage guidelines

An interface sends keepalive packets at keepalive intervals to detect the availability of the peer. If the interface receives no response to keepalive packets when the keepalive retry limit is reached, it determines that the link fails and reports a link layer down event.

To set the keepalive retry limit, use the **timer-hold retry** command.

On a slow link, increase the keepalive interval to prevent false shutdown of the interface. This situation might occur when keepalive packets are delayed because a large packet is being transmitted on the link.

Examples

```
# Set the keepalive interval to 20 seconds on Serial 0/2/0.
<Sysname> system-view
[Sysname] interface serial 0/2/0
[Sysname-Serial0/2/0] timer-hold 20

# Set the keepalive interval to 20 seconds on Virtual-Template 1.
<Sysname> system-view
[Sysname] interface virtual-template 1
[Sysname-Virtual-Template1] timer-hold 20
```

Related commands

timer-hold retry

timer-hold retry

Use **timer-hold retry** to set the keepalive retry limit on an interface.

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

Syntax

```
timer-hold retry retries  
undo timer-hold retry
```

Default

The keepalive retry limit is 5 on an interface.

Views

Interface view

Predefined user roles

network-admin

Parameters

retries: Specifies the maximum number of keepalive attempts in the range of 1 to 255.

Usage guidelines

An interface sends keepalive packets at keepalive intervals to detect the availability of the peer. If the interface receives no response to keepalive packets when the keepalive retry limit is reached, it determines that the link fails and reports a link layer down event.

To set the keepalive interval, use the **timer-hold** command.

On a slow link, increase the keepalive retry limit to prevent false shutdown of the interface. This situation might occur when keepalive packets are delayed because a large packet is being transmitted on the link.

Examples

```
# Set the keepalive retry limit to 10 for Serial 0/2/0.  
<Sysname> system-view  
[Sysname] interface serial 0/2/0  
[Sysname-Serial0/2/0] timer-hold retry 10  
  
# Set the keepalive retry limit to 10 for Virtual-Template 1.  
<Sysname> system-view  
[Sysname] interface virtual-template 1  
[Sysname-Virtual-Template1] timer-hold retry 10
```

Related commands

timer-hold

MP commands

display interface mp-group

Use **display interface mp-group** to display information about a specified MP-group interface or all MP-group interfaces.

Syntax

```
display interface [ mp-group [ interface-number ] ] [ brief [ description | down ] ]
```

Views

Any view

Predefined user roles

network-admin
network-operator

Parameters

mp-group [*interface-number*]: Specifies an existing MP-group interface by its number. If you do not specify the **mp-group** keyword, the command displays information about all interfaces except VA interfaces on the device. If you specify the **mp-group** keyword without the *interface-number* argument, the command displays information about all existing MP-group interfaces.

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

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

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

Examples

Display detailed information about MP-group 0/0/1.

```
<Sysname> display interface mp-group 0/0/1
MP-group0/0/1
Current state: UP
Line protocol state: UP
Description: MP-group0/0/1 Interface
Bandwidth: 2048kbps
Maximum transmission unit: 1500
Hold timer: 10 seconds,retry times: 5
Internet address: 192.168.1.200/24 (primary)
Link layer protocol: PPP
LCP: opened, MP: opened
Physical: MP, baudrate: 2048000 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 clearing of counters: Never
Last 300 seconds input rate: 0 bytes/sec, 0 packets/sec
Last 300 seconds output rate: 0 bytes/sec, 0 packets/sec
Input: 0 packets, 0 bytes, 0 drops
Output: 0 packets, 0 bytes, 0 drops
```

Display brief information about MP-group 0/0/1.

```
<Sysname> display interface mp-group 0/0/1 brief
Brief information on interfaces in route mode:
Link: ADM - administratively down; Stby - standby
Protocol: (s) - spoofing
Interface          Link Protocol Primary IP      Description
```

```
MP2/0/0          DOWN DOWN    --
```

Display brief information about the MP-group interfaces in physically down state and the causes.

```
<Sysname> display interface mp-group brief down
```

Brief information on interfaces in route mode:

Link: ADM - administratively down; Stby - standby

```
Interface          Link Cause
MP2/0/0            ADM  Administratively
MP2/0/1            DOWN Not connected
```

Table 9 Command output

Field	Description
Current state	Physical and administrative states of the interface: DOWN (Administratively)—The interface was administratively shut down with the shutdown command. DOWN—The interface is administratively up but physically down (possibly because no physical link is present or the link is faulty). UP—The interface is both administratively and physically up.
Line protocol state	Data link layer state: UP or DOWN.
Description	Interface description.
Bandwidth	Expected bandwidth of the interface.
Hold timer	Interval at which the interface sends keepalive packets.
retry times	Keepalive retry limit. The interface determines that its peer has been down if it does not receive a keepalive response when the keepalive retry limit is reached.
Internet protocol processing: Disabled	The interface cannot process IP packets currently.
Internet address: <i>ip-address/mask-length (Type)</i>	IP address of the interface and type of the address in parentheses. Possible IP address types include: Primary—Manually configured primary IP address. Sub—Manually configured secondary IP address. If the interface has both primary and secondary IP addresses, the primary IP address is displayed. If the interface has only secondary IP addresses, the lowest secondary IP address is displayed. DHCP-allocated—DHCP allocated IP address. For more information, see DHCP client configuration in <i>Layer 3—IP Services Configuration Guide</i>. BOOTP-allocated—BOOTP allocated IP address. For more information, see BOOTP client configuration in <i>Layer 3—IP Services Configuration Guide</i>. PPP-negotiated—IP address assigned by a PPP server during PPP negotiation. Unnumbered—IP address borrowed from another interface. MTunnel—IP address of the multicast tunnel interface (MTI), which is the same as the IP address of the MVPN source interface. For more information, see multicast VPN configuration in <i>IP Multicast Configuration Guide</i>.
LCP: opened, MP: opened	LCP negotiation is complete.
Physical	Physical type of the interface.

Field	Description
baudrate	Baud rate of the interface.
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	Traffic statistics of the interface output queues.
Last clearing of counters: Never	Last time when statistics on the interface were cleared. Never indicates that statistics on the interface were never cleared.
Last 300 seconds input rate: 0 bytes/sec, 0 packets/sec Last 300 seconds output rate: 0 bytes/sec, 0 packets/sec	Average rate of input packets and output packets in the last 300 seconds.
Input: 0 packets, 0 bytes, 0 drops	Total number of inbound packets of the interface (in the number of packets and in bytes), and the number of dropped incoming packets.
Output: 0 packets, 0 bytes, 0 drops	Total number of outbound packets of the interface (in the number of packets and in bytes), and the number of dropped outgoing packets.
Brief information on interfaces in 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, execute the undo shutdown command. Stby—The interface is operating as a backup interface. To see the primary interface, use the display interface-backup state command in <i>High Availability Command Reference</i>.
Protocol: (s) - spoofing	Indicates the line protocol is UP, but the physical link is an on-demand link or is not present.
Interface	Abbreviated interface name.
Link	Physical link state of the interface: UP—The interface is physically up. DOWN—The interface is physically down. ADM—The interface has been administratively shut down. To recover its physical state, use the undo shutdown command. Stby—The interface is a backup interface.
Protocol	Line protocol state: UP—The line protocol is up. DOWN—The line protocol is down. UP(s)—The line protocol is up, but the physical link is an on-demand link or is not present.
Primary IP	Primary IP address of the interface.
Description	Interface description configured by using the description command. If you do not specify the description keyword, the display interface brief command displays a maximum of 27 characters of the description. If you specify the description keyword, the command displays the complete description.
Cause	Causes for the physical state of the interface to be Down:

Field	Description
	• Not connected—No physical connection exists (possibly because the network cable is disconnected or faulty). • Administratively—The interface was shut down with the shutdown command. To restore the physical state of the interface, use the undo shutdown command.

Related commands

reset counters interface mp-group

display ppp mp

Use **display ppp mp** to display MP information for MP-group interfaces.

Syntax

display ppp mp [**interface** *interface-type interface-number*]

Views

Any view

Predefined user roles

network-admin

network-operator

Parameters

interface *interface-type interface-number*: Specifies an interface by its number. If you do not specify this option, the command displays MP information for all interfaces.

Examples

Display MP information. (MP is configured through an MP-group interface.)

```
<Sysname> display ppp mp
```

```
Template: MP-group0/0/1
```

```
max-bind: 20, fragment: enabled, min-fragment: 128
```

```
Master link: MP-group0/0/1, Active members: 2, Bundle Multilink
```

```
Peer's endPoint descriptor: MP-group0/0/1
```

```
Sequence format: short (rcv)/long (sent)
```

```
Bundle Up Time: 2012/11/05 07:29:33:612
```

```
0 lost fragments, 0 reordered, 0 unassigned, 0 interleaved
```

```
Sequence: 0 (rcv)/0 (sent)
```

```
Active member channels: 2 members
```

```
Serial0/2/0:15
```

```
Up-Time: 2012/11/05 07:29:33:613
```

```
Serial0/2/0:16
```

```
Up-Time: 2012/11/05 07:30:10:945
```

```
Inactive member channels: 2 members
```

```
Serial0/2/0:17
```

```
Serial0/2/0:18
```

Table 10 Command output

Field	Description
max-bind	Maximum number of links that can be bound.
fragment	Indicates whether MP fragmentation is enabled or disabled.

Field	Description
min-fragment	Minimum size of an MP fragment.
Sequence format: short (rcv)/long (sent)	Sequence number header format of MP. The short sequence number format is used in the incoming direction, and the long sequence number format is used in the outgoing direction.
reordered	Number of reassembled packets.
unassigned	Number of packets waiting for being reassembled.
interleaved	Number of interleaved fragments. LFI breaks larger packets into fragments and interleaves the fragments between smaller packets for transmission.
Sequence: 0 (rcv)/0 (sent)	Received sequence number/sent sequence number.
Up-Time	Uptime of a member channel.

interface mp-group

Use **interface mp-group** to create an MP-group interface and enter its view, or enter the view of an existing MP-group interface.

Use **undo interface mp-group** to remove an MP-group interface.

Syntax

```
interface mp-group mp-number
undo interface mp-group mp-number
```

Default

No MP-group interfaces exists.

Views

System view

Predefined user roles

network-admin

Parameters

mp-number: Specifies an MP-group interface by its number.

Usage guidelines

You must use the **interface mp-group** command together with the **ppp mp mp-group** command. You can execute the two commands in either order.

Examples

```
# Create interface MP-group 0/0/1.
<Sysname> system-view
[Sysname] interface mp-group 0/0/1
[Sysname-MP-group0/0/1]
```

ppp mp

Use **ppp mp** to enable MP for an interface.

Use **undo ppp mp** to disable MP on an interface.

Syntax

```
ppp mp
undo ppp mp
```

Default

An interface is enabled with PPP.

Views

Interface view

Predefined user roles

network-admin

Usage guidelines

To obtain more bandwidth, you can bind multiple PPP links to form a logical MP interface.

Examples

```
# Enable MP for Serial 0/2/0.
<Sysname> system-view
[Sysname] interface serial 0/2/0
[Sysname-Serial0/2/0] ppp mp

# Enable MP for Virtual-Template 1.
<Sysname> system-view
[Sysname] interface virtual-template1
[Sysname-Virtual-Template1] ppp mp
```

ppp mp binding-mode

Use **ppp mp binding-mode** to set the MP binding mode on an interface.

Use **undo ppp mp binding-mode** to restore the default.

Syntax

```
ppp mp binding-mode { authentication | both | descriptor }
undo ppp mp binding-mode
```

Default

Both the username and the descriptor are used for MP binding on an interface.

Views

VT interface view
Dialer interface view

Predefined user roles

network-admin

Parameters

authentication: Uses the username for MP binding.

both: Uses both the username and the endpoint descriptor for MP binding.

descriptor: Uses the endpoint descriptor for MP binding.

Usage guidelines

The username is obtained from the peer during PAP, CHAP, MS-CHAP, or MS-CHAP-V2 authentication. The endpoint descriptor, which uniquely identifies a device, is obtained from the peer during LCP negotiation. Based on the username or endpoint descriptor, the system can locate the corresponding VT interface and create an MP bundle according to the template.

The **descriptor** mode cannot differentiate users. To bind users to different bundles, use the **both** mode.

The **authentication** mode cannot differentiate peer devices. When multiple peer devices exist, use the **both** mode.

Examples

```
# Specify Virtual-Template 1 to use the username for MP binding.
<Sysname> system-view
[Sysname] interface virtual-template1
[Sysname-Virtual-Template1] ppp mp binding-mode authentication
```

ppp mp endpoint

Use **ppp mp endpoint** to set the endpoint option.

Use **undo ppp mp endpoint** to restore the default.

Syntax

```
ppp mp endpoint endpoint
undo ppp mp endpoint
```

Default

The endpoint option carries the device name on an interface.

Views

Interface view

Predefined user roles

network-admin

Parameters

endpoint: Specifies the content of the endpoint option, a case-sensitive string of 1 to 20 characters.

Usage guidelines

The endpoint option (terminal descriptor) is negotiated during MP LCP negotiation.

When MP is configured by using a VT interface, an MP endpoint bases its link binding decisions on the remote endpoint descriptors, and assigns the links that receive the same endpoint descriptor to the same bundle. To avoid incorrect link binding on a VT interface, make sure the link descriptors used by different devices are unique. You must reconfigure an endpoint descriptor for a device if the default endpoint descriptor (device name) cannot uniquely identify the MP bundle at the remote end.

When MP is configured by using an MP-group interface, the negotiating endpoints do not base their binding decisions on the endpoint descriptor. By default, the endpoint descriptor of an interface in an MP-group is the MP-group interface name. If you configure an endpoint descriptor for the interface, the configured MP endpoint descriptor takes effect.

If the endpoint descriptor exceeds 20 bytes, the first 20 bytes are taken as the endpoint descriptor.

Examples

```
# Configure the endpoint descriptor of Serial 0/2/0 as 123456.
<Sysname> system-view
[Sysname] interface serial 0/2/0
[Sysname-Serial0/2/0] ppp mp endpoint 123456

# Configure the endpoint descriptor of Virtual-Template 1 as 123456.
<Sysname> system-view
[Sysname] interface virtual-template1
[Sysname-Virtual-Template1] ppp mp endpoint 123456
```

ppp mp fragment disable

Use **ppp mp fragment disable** to disable MP fragmentation on an interface.

Use **undo ppp mp fragment disable** to enable MP fragmentation on an interface.

Syntax

```
ppp mp fragment disable
undo ppp mp fragment disable
```

Default

MP fragmentation is enabled on an interface.

Views

VT interface view
Dialer interface view
MP-group interface view

Predefined user roles

network-admin

Usage guidelines

If the peer device does not support fragment reassembly, you must configure the **ppp mp fragment disable** command to disable MP fragmentation on the local device. This enables the two devices to communicate. After that, outgoing packets are not fragmented, but they still carry an MP sequence number and fragment tag.

After you execute the **ppp mp fragment disable** command on an interface, the settings configured with the **ppp mp lfi enable** and **ppp mp min-fragment** commands do not take effect on the interface.

Examples

```
# Disable MP fragmentation on MP-group 0/0/1.
<Sysname> system-view
[Sysname] interface mp-group 0/0/1
[Sysname-MP-group0/0/1] ppp mp fragment disable
```

Related commands

```
ppp mp lfi enable
ppp mp min-fragment
```

ppp mp lfi delay-per-frag

Use **ppp mp lfi delay-per-frag** to set the maximum LFI fragment transmission delay on an interface.

Use **undo ppp mp lfi delay-per-frag** to restore the default.

Syntax

```
ppp mp lfi delay-per-frag time  
undo ppp mp lfi delay-per-frag
```

Default

The maximum LFI fragment transmission delay is 10 ms on an interface.

Views

VT interface view
Dialer interface view
MP-group interface view

Predefined user roles

network-admin

Parameters

time: Specifies the maximum LFI fragment transmission delay, in the range of 1 to 1000 ms.

Examples

```
# Set the maximum LFI fragment transmission delay to 20 ms on MP-group 0/0/1.  
<Sysname> system-view  
[Sysname] interface mp-group 0/0/1  
[Sysname-MP-group0/0/1] ppp mp lfi delay-per-frag 20
```

Related commands

```
ppp mp lfi enable  
ppp mp lfi size-per-frag
```

ppp mp lfi enable

Use **ppp mp lfi enable** to enable LFI on an interface.

Use **undo ppp mp lfi** to disable LFI on an interface.

Syntax

```
ppp mp lfi enable  
undo ppp mp lfi enable
```

Default

LFI is disabled on an interface.

Views

VT interface view
Dialer interface view
MP-group interface view

Predefined user roles

network-admin

Usage guidelines

Disabling LFI also removes the user-configured settings of the maximum LFI fragment transmission delay and size.

Examples

```
# Enable LFI on MP-group 0/0/1.
<Sysname> system-view
[Sysname] interface mp-group 0/0/1
[Sysname-MP-group0/0/1] ppp mp lfi enable
```

Related commands

```
ppp mp lfi delay-per-frag
ppp mp lfi size-per-frag
```

ppp mp lfi size-per-frag

Use **ppp mp lfi size-per-frag** to set the maximum LFI fragment size (in bytes) on an interface.

Use **undo ppp mp lfi size-per-frag** to restore the default.

Syntax

```
ppp mp lfi size-per-frag size
undo ppp mp lfi size-per-frag
```

Default

On an interface, the maximum LFI fragment size is derived from this formula: (Expected bandwidth of the interface x Maximum LFI fragment transmission delay)/8.

Views

VT interface view
Dialer interface view
MP-group interface view

Predefined user roles

network-admin

Parameters

size: Specifies the maximum LFI fragment size in the range of 40 to 1500 bytes.

Usage guidelines

When LFI is enabled and both this command and the **ppp mp lfi delay-per-frag** command are configured, the maximum LFI fragment size is the value configured with the **ppp mp lfi size-per-frag** command.

Examples

```
# Set the maximum LFI fragment size to 80 bytes on MP-group 0/0/1.
<Sysname> system-view
[Sysname] interface mp-group 0/0/1
[Sysname-MP-group0/0/1] ppp mp lfi size-per-frag 80
```

Related commands

ppp mp lfi enable
ppp mp lfi delay-per-frag

ppp mp load-sharing mode strict-round-robin

Use **ppp mp load-sharing mode strict-round-robin** to enable the strict load sharing mode for an MP-group interface.

Use **undo ppp mp load-sharing mode strict-round-robin** to restore the default.

Syntax

ppp mp load-sharing mode strict-round-robin
undo ppp mp load-sharing mode strict-round-robin

Default

An MP-group interface uses the smart load sharing mode.

Views

MP-group interface view

Predefined user roles

network-admin

Usage guidelines

For an MP-group interface in smart load sharing mode, the idle interfaces that have been recently used are used for sending packet fragments. For an MP-group interface in strict load sharing mode, interfaces are used in the order that they join the MP-group interface.

Examples

```
# Enable the strict loading sharing mode on MP-group 0/0/1.  
<Sysname> system-view  
[Sysname] interface mp-group2/0/0  
[Sysname-MP-group0/0/1] ppp mp load-sharing mode strict-round-robin
```

ppp mp max-bind

Use **ppp mp max-bind** to set the maximum number of PPP links in an MP bundle on an interface.

Use **undo ppp mp max-bind** to restore the default.

Syntax

ppp mp max-bind *max-bind-num*
undo ppp mp max-bind

Default

The maximum number of PPP links in an MP bundle is 16 on an interface.

Views

VT interface view
Dialer interface view
MP-group interface view

Predefined user roles

network-admin

Parameters

max-bind-num: Specifies the maximum number of PPP links in an MP bundle, in the range of 1 to 128.

Usage guidelines



IMPORTANT:

Use the default setting in most situations. Inappropriate use of this command can cause PPP performance degradation. Make sure you understand the impact of this command on your network before you use it.

Set the maximum number of PPP links in an MP bundle to be greater than the actual number of bound links. Otherwise, MP binding fails.

The maximum number of PPP links configured for an MP bundle takes effect immediately. If the configured maximum number is smaller than the number of existing PPP links, the existing links are not affected.

Examples

```
# Set the maximum number of PPP links in an MP bundle to 12 on MP-group 0/0/1.
<Sysname> system-view
[Sysname] interface mp-group 0/0/1
[Sysname-MP-group0/0/1] ppp mp max-bind 12
```

ppp mp min-bind

Use **ppp mp min-bind** to set the minimum number of PPP links in an MP bundle on a dialer interface.

Use **undo ppp mp min-bind** to restore the default.

Syntax

```
ppp mp min-bind min-bind-num
undo ppp mp min-bind
```

Default

On a dialer interface, the minimum number of PPP links in an MP bundle is 0, which means that MP dial-up relies on traffic detection.

Views

Dialer interface view

Predefined user roles

network-admin

Parameters

min-bind-num: Specifies the minimum number of PPP links in an MP bundle, in the range of 0 to 128.

Usage guidelines

This command specifies the minimum number of PPP links in a MP bundle to ensure the minimum bandwidth for the service.

When the minimum number of PPP links is set to a non-zero value, subsequent MP dial-up operations will not depend on traffic detection, but existing dial-up connections will be removed upon timeout.

The min-bind-num argument cannot be greater than the maximum number set with the **ppp mp max-bind** command.

Examples

```
# Set the minimum number of PPP links in an MP bundle to 4 on Dialer 0.
<Sysname> system-view
[Sysname] interface dialer 0
[Sysname-Dialer0] ppp mp min-bind 4
```

Related commands

ppp mp max-bind

ppp mp min-fragment

Use **ppp mp min-fragment** to set the minimum MP packet fragmentation size on an interface.

Use **undo ppp mp min-fragment** to restore the default.

Syntax

```
ppp mp min-fragment size
undo ppp mp min-fragment
```

Default

The minimum MP packet fragmentation size is 128 bytes on an interface.

Views

VT interface view
Dialer interface view
MP-group interface view

Predefined user roles

network-admin

Parameters

size: Specifies the minimum MP packet fragmentation size in the range of 128 to 1500 bytes. Outgoing MP packets less than the minimum value will not be fragmented, and those greater than or equal to the minimum value will be fragmented.

Usage guidelines

If MP binding is implemented through hardware, the minimum MP packet fragmentation size varies with chips. The minimum MP packet fragmentation size on certain chips can only be 128, 256, or 512 bytes. To successfully create the MP bundle and establish the sub-channel LCP link, make sure the setting configured with the **ppp mp min-fragment** command conforms to the hardware specifications.

Examples

```
# Set the minimum MP packet fragmentation size to 500 bytes on MP-group 0/0/1.
<Sysname> system-view
[Sysname] interface mp-group 0/0/1
[Sysname-MP-group0/0/1] ppp mp min-fragment 500
```

ppp mp mp-group

Use **ppp mp mp-group** to assign an interface to an MP group, and enable MP for the interface.

Use **undo ppp mp** to restore the default.

Syntax

```
ppp mp mp-group mp-number  
undo ppp mp
```

Default

An interface is enabled with PPP.

Views

Interface view

Predefined user roles

network-admin

Parameters

mp-number: Specifies an MP-group interface by its number.

Usage guidelines

This command should be used with the **interface mp-group** command. You can create an MP group interface and then assign an interface to the MP group. You can also assign an interface to an MP group and then create the MP group.

Examples

```
# Assign Serial 0/2/0 to MP-group 0/0/1.  
<Sysname> system-view  
[Sysname] interface serial 0/2/0  
[Sysname-Serial0/2/0] ppp mp mp-group 0/0/1
```

Related commands

interface mp-group

ppp mp short-sequence

Use **ppp mp short-sequence** to trigger MP short sequence number header format negotiation on an interface. After the negotiation succeeds, the local end receives packets with short sequence numbers.

Use **undo ppp mp short-sequence** to restore the default.

Syntax

```
ppp mp short-sequence  
undo ppp mp short-sequence
```

Default

The long sequence number header format is used on an interface.

Views

Interface view

Predefined user roles

network-admin

Usage guidelines

This command applies to the incoming direction only. To enable the local end to transmit packets with short sequence numbers, execute this command on the remote end.

The sequence number format (long or short) of an MP bundle depends on the configuration of the first channel joining the MP bundle.

To negotiate the use of short sequence numbers on a common MP bundle, execute the command on all its channels. To negotiate the use of short sequence numbers on a dialer MP bundle, execute the command on the dialer interfaces and the ISDN D channels. The command will cause PPP re-negotiation.

Examples

```
# Configure the short sequence number header format of MP in the incoming direction of Serial 0/2/0.
```

```
<Sysname> system-view
[Sysname] interface serial 0/2/0
[Sysname-Serial0/2/0] ppp mp mp-group 0/0/1
[Sysname-Serial0/2/0] ppp mp short-sequence
```

```
# Configure the short sequence number header format of MP in the incoming direction of Virtual-Template 1.
```

```
<Sysname> system-view
[Sysname] interface virtual-template1
[Sysname-Virtual-Template1] ppp mp short-sequence
```

ppp mp sort-buffer-size

Use **ppp mp sort-buffer-size** to set the MP sort buffer size factor on an interface.

Use **undo ppp mp sort-buffer-size** to restore the default.

Syntax

```
ppp mp sort-buffer-size size
undo ppp mp sort-buffer-size
```

Default

The MP sort buffer size factor is 1 on an interface.

Views

VT interface view
Dialer interface view
MP-group interface view

Predefined user roles

network-admin

Parameters

size: Specifies the MP sort buffer size factor in the range of 1 to 64.

Usage guidelines

The MP sort buffer size = the number of channels in the current MP bundle × size. You can use the **display ppp mp** command to view the number of member channels in an MP bundle. If the calculated MP sort buffer size is 20, the MP sort buffer can sort 20 packets.

When MP is used, the received packets might be out of order. The sort buffer is used to re-sort packets. A large sort buffer results in better re-sorting but increases delay. For voice packets, the transmission delay should be minimized.

Examples

```
# Set the MP sort buffer size factor to 64 on MP-group 0/0/1.
<Sysname> system-view
[Sysname] interface mp-group 0/0/1
[Sysname-MP-group0/0/1] ppp mp sort-buffer-size 64
```

ppp mp timer lost-fragment

Use **ppp mp timer lost-fragment** to set the timer for MP to wait for the expected fragments on an interface.

Use **undo ppp mp timer lost-fragment** to restore the default.

Syntax

```
ppp mp timer lost-fragment seconds
undo ppp mp timer lost-fragment
```

Default

The timer for MP to wait for the expected fragments is 30 seconds on an interface.

Views

- VT interface view
- Dialer interface view
- MP-group interface view

Predefined user roles

- network-admin

Parameters

seconds: Specifies the timer for MP to wait for the expected fragment, in the range of 1 to 255 seconds.

Usage guidelines

A receiving end puts the received fragments in the buffer and reassembles them when it receives all the packet's fragments. You can configure a timer for MP to wait for the expected fragments. When the receiving end receives the first fragment of a packet, it starts the timer. When the timer expires, the system checks whether or not all fragments have arrived. If they have all arrived, the system reassembles the fragments. If they have not all arrived, the system discards all received fragments to release the buffer space.

Examples

```
# Set the timer for MP to wait for the expected fragment to 20 seconds on MP-group 0/0/1.
<Sysname> system-view
[Sysname] interface mp-group 0/0/1
[Sysname-MP-group0/0/1] ppp mp timer lost-fragment 20
```

ppp mp user

Use **ppp mp user** to associate a username with a VT interface.

Use **undo ppp mp user** to remove the association.

Syntax

```
ppp mp user username bind virtual-template number  
undo ppp mp user username
```

Default

No username is associated with a VT interface.

Views

System view

Predefined user roles

network-admin

Parameters

username: Specifies a username, a case-sensitive string of 1 to 80 characters.

bind virtual-template *number*: Specifies a VT interface by its number in the range of 0 to 1023.

Usage guidelines

This command associates a username with a VT interface. After the user passes authentication, the system uses the settings on the VT interface to create an MP bundle and a VA interface to transmit data.

You can configure the following parameters for a VT interface:

- Local IP address and the peer IP address (or address pool).
- **ppp mp**-commands.

Examples

```
# Associate username user 1 with Virtual-Template 1, and set the IP address of the VT interface to 202.38.60.1/24.
```

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

```
[Sysname] ppp mp user user1 bind virtual-template 1
```

```
[Sysname] interface virtual-template 1
```

```
[Sysname-Virtual-Template1] ip address 202.38.60.1 255.255.255.0
```

Related commands

ppp mp

ppp mp virtual-template

Use **ppp mp virtual-template** to bind an interface to a VT interface and enable MP for the interface.

Use **undo ppp mp** to restore the default.

Syntax

```
ppp mp virtual-template number  
undo ppp mp
```

Default

An interface is enabled with PPP.

Views

Interface view

Predefined user roles

network-admin

Parameters

number: Specifies a VT interface by its number.

Usage guidelines

After you bind an interface to a VT interface, you can optionally enable PAP, CHAP, MS-CHAP, or MS-CHAP-V2 authentication.

The interfaces bound to the same VT interface are bound together. The **ppp mp virtual-template** command and the **ppp mp** command are mutually exclusive.

Examples

```
# Bind Serial 0/2/0 to Virtual-Template 1, and enable MP for Serial 0/2/0.
<Sysname> system-view
[Sysname] interface serial 0/2/0
[Sysname-Serial0/2/0] ppp mp virtual-template 1
```

Related commands

ppp mp

reset counters interface mp-group

Use **reset counters interface mp-group** to clear statistics on MP-group interfaces.

Syntax

```
reset counters interface [ mp-group [ interface-number ] ]
```

Views

User view

Predefined user roles

network-admin

Parameters

mp-group: Clears traffic statistics on MP-group interfaces.

interface-number: Specifies an existing MP-group interface by its number.

Usage guidelines

Before collecting traffic statistics regularly on an MP-group interface, clear the existing statistics.

If you do not specify the **mp-group** keyword, the command clears statistics on all interfaces.

If you specify the **mp-group** keyword without the *interface-number* argument, the command clears statistics on all MP-group interfaces.

If you specify both **mp-group** and *interface-number*, the command clears statistics on the specified MP-group interface.

Examples

```
# Clear the statistics of MP-group 0/0/1.  
<Sysname> reset counters interface mp-group 0/0/1
```

Related commands

display interface mp-group

shutdown

Use **shutdown** to shut down an MP-group interface.

Use **undo shutdown** to bring up an MP-group interface.

Syntax

shutdown

undo shutdown

Default

An MP-group interface is up.

Views

MP-group interface view

Predefined user roles

network-admin

Usage guidelines

Executing this command to shut down an MP-group interface will make MP based on this interface become unavailable. As a best practice, make sure you fully understand the impact before executing this command.

Examples

```
# Shut down MP-group 0/0/1.  
<Sysname> system-view  
[Sysname] interface mp-group 0/0/1  
[Sysname-MP-group0/0/1] shutdown
```

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HDLC commands

The following matrixes show support of hardware platform for this feature:

Models	Feature compatibility
MSR1008	No
MSR2630E-X1	Yes
MSR3610E-X1, MSR3610E-X1-DP	Yes

Models	Feature compatibility
MSR2660-XS	No
MSR2680-XS	Yes

Models	Feature compatibility
MSR2600-12X-WiNet	No
MSR2610-13X-WiNet	Yes

link-protocol hdlc

Use **link-protocol hdlc** to enable HDLC encapsulation on an interface.

Syntax

link-protocol hdlc

Default

PPP encapsulation is enabled on an interface.

Views

Serial interface view

Predefined user roles

network-admin

Usage guidelines

HDLC can transport the network layer protocols, such as IP and IPv6.

Examples

```
# Enable HDLC encapsulation on Serial 0/2/0.
<Sysname> system-view
[Sysname] interface serial 0/2/0
[Sysname-Serial0/2/0] link-protocol hdlc
```

timer-hold

Use **timer-hold** to set the keepalive interval on an interface.

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

Syntax

```
timer-hold seconds  
undo timer-hold
```

Default

The keepalive interval is 10 seconds on an interface.

Views

Serial interface view

Predefined user roles

network-admin

Parameters

seconds: Specifies the keepalive interval in the range 0 to 32767 seconds.

Usage guidelines

HDLC uses the polling mechanism to determine whether the link status is normal.

An HDLC-enabled interface can regularly check link status by sending keepalives to the peer at the keepalive interval at the link layer. A keepalive carries the local sender sequence number and the last received sequence number of the peer.

After sending a keepalive, an interface increments the sender sequence number by 1 in the next keepalive when the following conditions exist:

- The interface receives a response within the keepalive interval.
- The response carries the sender sequence number in the sent keepalive.

After sending a keepalive, if the interface does not receive a response within the keepalive interval, it resends the keepalive with an unchanged sequence number. When the keepalive retry limit is reached, the interface considers the link faulty and reports a link layer down event.

Link status check is disabled if you set the keepalive interval to 0.

As a best practice, set the same keepalive interval for the two ends of a link.

If the network has a long delay or is experiencing congestion, you can increase the keepalive interval to prevent the link from being closed.

Examples

```
# Set the keepalive interval to 100 seconds on Serial 0/2/0.  
<Sysname> system-view  
[Sysname] interface serial 0/2/0  
[Sysname-Serial0/2/0] timer-hold 100
```

Related commands

```
timer-hold retry
```

timer-hold retry

Use **timer-hold retry** to set the keepalive retry limit on an interface.

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

Syntax

```
timer-hold retry retries  
undo timer-hold retry
```

Default

The keepalive retry limit is 5 on an interface.

Views

Serial interface view

Pre-defined user roles

network-admin

Parameters

retries: Specifies the keepalive retry limit in the range of 1 to 255.

Usage guidelines

HDLC uses the polling mechanism to determine whether the link status is normal.

An HDLC-enabled interface can regularly check link status by sending keepalives to the peer at the keepalive interval at the link layer. A keepalive carries the local sender sequence number and the last received sequence number of the peer.

After sending a keepalive, an interface increments the sender sequence number by 1 in the next keepalive when the following conditions exist:

- The interface receives a response within the keepalive interval.
- The response carries the sender sequence number in the sent keepalive.

After sending a keepalive, if the interface does not receive a response within the keepalive interval, it resends the keepalive with an unchanged sequence number. When the keepalive retry limit is reached, the interface considers the link faulty and reports a link layer down event.

If the network has a long delay or is experiencing congestion, you can increase the keepalive retry limit to prevent the link from being closed.

Examples

```
# Set the keepalive retry limit to 10 on Serial 0/2/0.
<Sysname> system-view
[Sysname] interface serial 0/2/0
[Sysname-Serial0/2/0] timer-hold retry 10
```

Related commands

timer-hold

HDLC link bundling commands

bandwidth

Use **bandwidth** to set 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

HDLC link bundle 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 to 1000 kbps for HDLC link bundle interface 1.
<Sysname> system-view
[Sysname] interface hdlc-bundle 1
[Sysname-HDLC-bundle1] bandwidth 1000
```

bundle id

Use **bundle id** to assign an interface to an HDLC link bundle.

Use **undo bundle id** to restore the default.

Syntax

bundle id *bundle-id*

undo bundle id

Default

An interface is not assigned to any HDLC link bundle.

Views

Serial interface view

Predefined user roles

network-admin

Parameters

bundle-id: Specifies an HDLC link bundle by its number. The value range for this argument is 1 to 10.

Usage guidelines

An interface can be the member of only one HDLC link bundle. To move an interface from one HDLC link bundle to another HDLC link bundle, remove the interface from the current HDLC link bundle first.

You must enable HDLC encapsulation on an interface to be assigned to an HDLC link bundle. You cannot change the link layer protocol encapsulation of an HDLC link bundle member interface.

You can assign interfaces to an HDLC link bundle before you create the HDLC link bundle.

Examples

```
# Assign Serial 0/2/0 to HDLC link bundle 1.
<Sysname> system-view
[Sysname] interface serial 0/2/0
[Sysname-Serial0/2/0] bundle id 1
```

bundle load-balance

Use **bundle load-balance** to set the load balancing mode for an HDLC link bundle interface.

Use **undo bundle load-balance** to restore the default.

Syntax

```
bundle load-balance { per-flow | per-packet }
undo bundle load-balance
```

Default

Per-packet load balancing is used.

Views

HDLC link bundle interface view

Predefined user roles

network-admin

Parameters

per-flow: Specifies per-flow load balancing.

per-packet: Specifies per-packet load balancing.

Usage guidelines

The following load balancing modes are available:

- **Per-flow load balancing**—Forwards packets of the same flow out of the same Selected interface. A flow is identified by match criteria.
 - For IPv4 and IPv6 packets, the match criteria include source IP address and destination IP address.
 - For MPLS packets, the match criteria are MPLS labels.
- **Per-packet load balancing**—Distributes packets evenly across all Selected interfaces by using the round-robin method.

Examples

```
# Set per-flow load balancing mode for HDLC link bundle interface 1.
<Sysname> system-view
[Sysname] interface hdlc-bundle 1
[Sysname-HDLC-bundle1] bundle load-balance per-flow
```

bundle max-active links

Use **bundle max-active links** to set the maximum number of Selected interfaces allowed in an HDLC link bundle.

Use **undo bundle max-active links** to restore the default.

Syntax

```
bundle max-active links number
undo bundle max-active links
```

Default

The maximum number of Selected interfaces allowed in an HDLC link bundle is the maximum number supported by the device.

Views

HDLC link bundle interface view

Predefined user roles

network-admin

Parameters

number: Specifies the maximum number of Selected interfaces allowed in an HDLC link bundle. The value range for this argument is 1 to 16.

Usage guidelines

The value specified by using this command cannot be smaller than the value specified by using the **bundle min-active links** command.

Use the **bundle max-active links** command together with the **bundle member-priority** command to make sure both ends of a link always have the same Selected status. The communication fails when one end is Selected but the other end is Unselected.

Examples

```
# Set the maximum number of Selected interfaces allowed in HDLC link bundle 1 to 8.
<Sysname> system-view
[Sysname] interface hdlc-bundle 1
[Sysname-HDLC-bundle1] bundle max-active links 8
```

Related commands

```
bundle member-priority
bundle min-active links
```

bundle member-priority

Use **bundle member-priority** to set the bundling priority value for an HDLC-enabled interface.

Use **undo bundle member-priority** to restore the default.

Syntax

```
bundle member-priority priority  
undo bundle member-priority
```

Default

The bundling priority value of an HDLC-enabled interface is 32768.

Views

Serial interface view

Predefined user roles

network-admin

Parameters

priority: Specifies the bundling priority value of an HDLC-enabled interface. The value range for this argument is 1 to 65535. A higher priority value means a lower bundling priority.

Examples

```
# Set the bundling priority value to 1 for HDLC-enabled interface Serial 0/2/0.  
<Sysname> system-view  
[Sysname] interface serial 0/2/0  
[Sysname-Serial0/2/0] bundle member-priority 1
```

bundle min-active bandwidth

Use **bundle min-active bandwidth** to set the minimum bandwidth required for bringing up an HDLC link bundle interface.

Use **undo bundle min-active bandwidth** to restore the default.

Syntax

```
bundle min-active bandwidth bandwidth  
undo bundle min-active bandwidth
```

Default

The minimum bandwidth required for bringing up an HDLC link bundle is not set.

Views

HDLC link bundle interface view

Predefined user roles

network-admin

Parameters

bandwidth: Specifies the minimum bandwidth (in kbps) required for bringing up an HDLC link bundle interface. The value range for this argument is 64 to 1342177280.

Examples

```
# Set the minimum bandwidth required for bringing up HDLC link bundle 1 to 1000 kbps.  
<Sysname> system-view  
[Sysname] interface hdlc-bundle 1  
[Sysname-HDLC-bundle1] bundle min-active bandwidth 1000
```

bundle min-active links

Use **bundle min-active links** to set the minimum number of Selected interfaces required for bringing up an HDLC link bundle interface.

Use **undo bundle min-active links** to restore the default.

Syntax

```
bundle min-active links number  
undo bundle min-active links
```

Default

The minimum number of Selected interfaces required for bringing up an HDLC link bundle is not set.

Views

HDLC link bundle interface view

Predefined user roles

network-admin

Parameters

number: Specifies the minimum number of Selected interfaces required for bringing up an HDLC link bundle interface. The value range for this argument is 1 to 16.

Usage guidelines

The value specified by using this command cannot be greater than the value specified by using the **bundle max-active links** command.

Examples

```
# Set the minimum number of Selected interfaces required for bringing up HDLC link bundle 1 to 5.  
<Sysname> system-view  
[Sysname] interface hdlc-bundle 1  
[Sysname-HDLC-bundle1] bundle min-active links 5
```

Related commands

```
bundle max-active links
```

default

Use **default** to restore the default settings for an HDLC link bundle interface.

Syntax

```
default
```

Views

HDLC link bundle 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 impact of this command when you use it on a live network.

This command might fail to restore the default settings for some commands for reasons such as command dependencies or 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 HDLC link bundle interface 1.
<Sysname> system-view
[Sysname] interface hdlc-bundle 1
[Sysname-HDLC-bundle1] default
```

description

Use **description** to configure 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 followed by the **Interface** string, for example, **Hdlc-bundle1 Interface**.

Views

HDLC link bundle interface view

Predefined user roles

network-admin

Parameters

text: Specifies an interface description, a case-sensitive string of 1 to 255 characters.

Examples

```
# Set the description of HDLC link bundle interface 1 to HDLC-bundle interface.
<Sysname> system-view
[Sysname] interface hdlc-bundle 1
[Sysname-HDLC-bundle1] description HDLC-bundle interface
```

display bundle hdlc-bundle

Use **display bundle hdlc-bundle** to display information about an HDLC link bundle.

Syntax

```
display bundle hdlc-bundle [bundle-id] slot slot-number
```

Views

Any view

Predefined user roles

network-admin

network-operator

Parameters

bundle-id: Specifies an HDLC link bundle by its number. If this argument is not specified, this command displays information for all HDLC link bundles.

slot slot-number: Specifies a card by its slot number.

Examples

Display information about HDLC link bundle 1 on the interface card in slot 0 or IRF member device 0.

```
<Sysname> display bundle hdlc-bundle 1 slot 0
```

Bundle: HDLC-bundle1, slot 0

max-active links: 2, min-active links: 2, min-active bandwidth: 1000000 kbps

Selected members: 2, Total bandwidth: 1244160 kbps

Member	State	Bandwidth(kbps)	Priority
Serial0/2/0	Selected	622080	1
Serial0/2/1	Selected	622080	2

Table 1 Command output

Field	Description
Bundle	Name of the HDLC link bundle.
max-active links	Maximum number of Selected interfaces allowed in the HDLC link bundle interface. This field will not be displayed if you have not set the limit.
min-active links	Minimum number of Selected interfaces required for bringing up the HDLC link bundle interface. This field will not be displayed if you have not set the limit.
min-active bandwidth	Minimum bandwidth required for bringing up the HDLC link bundle interface. This field will not be displayed if you have not set the limit.
Selected members	Current number of Selected interfaces.
Total bandwidth	Total bandwidth of all the Selected interfaces in the HDLC link bundle.
Member	Name of a member interface.
State	State of a member interface: • Selected—On an interface card, only information about Selected interfaces is displayed. • Ready. • Negotiated. • Initial.
Bandwidth(kbps)	Bandwidth (in kbps) of a member interface.
Priority	Bundling priority of a member interface.

display interface hdlc-bundle

Use **display interface hdlc-bundle** to display information about an HDLC link bundle interface.

Syntax

```
display interface [ hdlc-bundle [ bundle-id ] ] [ brief [ description | down ] ]
```

Views

Any view

Predefined user roles

network-admin
network-operator

Parameters

hdlc-bundle [*bundle-id*]: Specifies an HDLC link bundle interface by its number. If you do not specify the **hdlc-bundle** keyword, this command displays information about all interfaces except VA interfaces. If you specify the **hdlc-bundle** keyword without any HDLC link bundle interface number, this command displays information about all HDLC link bundle interfaces.

brief: Displays brief interface information. If you do not specify this keyword, this 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 each interface description.

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

Examples

Display detailed information about HDLC link bundle interface 1.

```
<Sysname> display interface hdlc-bundle 1
HDLC-bundle1
Current state: UP
Line protocol state: UP
Description: HDLC-bundle1 Interface
Bandwidth: 128kbps
Maximum Transmit Unit: 1500
Hold timer: 10 seconds, retry times: 5
Internet address: 1.1.1.1/24 (primary)
Link layer protocol: HDLC
Physical: HDLC-BUNDLE, baudrate: 128000 bps
Output queue - Urgent queuing: Size/Length/Discards 0/1024/0
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
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: 32 packets, 1842 bytes, 0 drops
Output: 27 packets, 1512 bytes, 0 drops
```

Display brief information about HDLC link bundle interface 1.

```
<Sysname> display interface hdlc-bundle 1 brief
Brief information on interfaces in route mode:
Link: ADM - administratively down; Stby - standby
Protocol: (s) - spoofing

```

Interface	Link	Protocol	Primary IP	Description
HDLC-B1	UP	UP	1.1.1.2	

Display information about all HDLC link bundle interfaces in down state and the link down reasons.

```
<Sysname> display interface hdlc-bundle brief down
```

Brief information on interfaces in route mode:

Link: ADM - administratively down; Stby - standby

Interface Link Cause

HDLC-B2 ADM Administratively

Table 2 Command output

Field	Description
Current state	Physical link state of the interface: • Administratively DOWN—The interface has been shut down by using the shutdown command. • DOWN—The interface is administratively up, but its physical state is down (possibly because no physical link exists or the link has failed). • UP—The interface is both administratively and physically up.
Line protocol state	Data link layer state of the interface. The state is determined through automatic parameter negotiation at the data link layer. • UP—The data link layer protocol is up. • DOWN—The data link layer protocol is down.
Description	Description of the interface.
Bandwidth	Expected bandwidth of the interface.
Maximum Transmit Unit	MTU on the interface.
Hold timer	Keepalive transmission interval of the interface. This field is ineffective for an HDLC link bundle interface because an HDLC link bundle interface does not transmit keepalives.
Retry times	Maximum number of keepalive retransmission attempts. A link is removed after the maximum number of retransmission attempts is reached.
Internet protocol processing: Disabled	The interface is not assigned an IP address and cannot process IP packets.

Field	Description
Internet address: <i>ip-address/mask-length (Type)</i>	IP address of the interface and type of the address in parentheses. Possible IP address types include: • Primary—Manually configured primary IP address. • Sub—Manually configured secondary IP address. If the interface has both primary and secondary IP addresses, the primary IP address is displayed. If the interface has only secondary IP addresses, the lowest secondary IP address is displayed. • DHCP-allocated—DHCP allocated IP address. For more information, see DHCP client configuration in <i>Layer 3—IP Services Configuration Guide</i>. • BOOTP-allocated—BOOTP allocated IP address. For more information, see BOOTP client configuration in <i>Layer 3—IP Services Configuration Guide</i>. • PPP-negotiated—IP address assigned by a PPP server during PPP negotiation. For more information, see PPP configuration in <i>Layer 2—WAN Access Configuration Guide</i>. • Unnumbered—IP address borrowed from another interface. • Cellular-allocated—IP address allocated through the modem-manufacturer's proprietary protocol. For more information, see mobile communication modem management in <i>Layer 2—WAN Access Configuration Guide</i>. • MTunnel—IP address of the multicast tunnel interface (MTI), which is the same as the IP address of the MVPN source interface. For more information, see multicast VPN configuration in <i>IP Multicast Configuration Guide</i>.
Link layer protocol	Link layer protocol encapsulation on the HDLC link bundle interface.
Physical	Physical type of the HDLC link bundle interface.
Baudrate	Baudrate of the HDLC link bundle interface.
Output queue - Urgent queuing: Size/Length/Discards 0/1024/0 Output queue - Protocol queuing: Size/Length/Discards 0/500/0 Output queue - FIFO queuing: Size/Length/Discards 0/75/0	Traffic statistics for each output queue on the HDLC link bundle interface, including: • The number of packets in the queue (the queue size). • The maximum number of packets that the queue can hold (queue length). • The number of dropped packets. The output queues on the HDLC link bundle interface include the following types: • Urgent queue. • Protocol queue. • FIFO queue.
Last clearing of counters	Time when the reset counters interface command was last used to clear the interface statistics. This field displays Never if the reset counters interface command has never been used on the interface since device startup.
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	Average incoming and outgoing traffic rates on the interface in the last 300 seconds.
Input: 32 packets, 1842 bytes, 0 drops	Incoming traffic size in packets and bytes and the number of dropped incoming packets on the interface.

Field	Description
Output: 27 packets, 1512 bytes, 0 drops	Outgoing traffic size in packets and bytes and the number of dropped outgoing packets on the interface.
Brief information on interfaces in route mode	Brief information about Layer 3 interfaces.
Interface	Abbreviated interface name.
Link	Physical link state of the interface: • UP—The interface is physically up. • DOWN—The interface is physically down. • ADM—The interface has been shut down by using the shutdown command. To restore the physical state of the interface, use the undo shutdown command. • Stby—The interface is a backup interface in standby state. To see the primary interface, use the display interface-backup state command.
Protocol	Data link layer protocol state of the interface: • UP—The data link layer protocol of the interface is up. • DOWN—The data link layer protocol of the interface is down. • UP(s)—The data link layer protocol of the interface is up, but the link is an on-demand link or does not exist. The (s) attribute represents the spoofing flag. This value is typical of null interfaces and loopback interfaces.
Primary IP	Primary IP address of the interface. This field displays two hyphens (--) if the interface does not have an IP address.
Cause	Cause for the physical link state of an interface to be DOWN . Administratively indicates that the interface has been manually shut down by using the shutdown command. To restore the physical state of the interface, use the undo shutdown command.

Related commands

reset counters interface

interface hdlc-bundle

Use **interface hdlc-bundle** to create an HDLC link bundle interface and enter its view, or enter the view of an existing HDLC link bundle interface.

Use **undo interface hdlc-bundle** to delete an HDLC link bundle interface.

Syntax

```
interface hdlc-bundle bundle-id
undo interface hdlc-bundle bundle-id
```

Default

No HDLC link bundle interface exists.

Views

System view

Predefined user roles

network-admin

Parameters

bundle-id: Specifies an HDLC link bundle interface by its number. The value range for this argument is 1 to 10.

Examples

```
# Create HDLC link bundle interface 1 and enter its view.
<Sysname> system-view
[Sysname] interface hdlc-bundle 1
[Sysname-HDLC-bundle1]
```

mtu

Use **mtu** to set the MTU size for an HDLC link bundle interface.

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

Syntax

```
mtu size
undo mtu
```

Default

The MTU size of an HDLC link bundle interface is 1500 bytes.

Views

HDLC link bundle interface view

Predefined user roles

network-admin

Parameters

size: Specifies the MTU in bytes for an HDLC link bundle interface. The value range for this argument is 46 to 9600.

Usage guidelines

The MTU size of an interface affects IP packet fragmentation and reassembly on the interface.

To make the MTU configuration take effect on an interface, you must re-enable the interface by using the **shutdown** command and the **undo shutdown** command.

Examples

```
# Set the MTU size of HDLC link bundle interface 1 to 1430 bytes.
<Sysname> system-view
[Sysname] interface hdlc-bundle 1
[Sysname-HDLC-bundle1] mtu 1430
```

reset counters interface hdlc-bundle

Use **reset counters interface hdlc-bundle** to clear the statistics of an HDLC link bundle interface.

Syntax

```
reset counters interface [ hdlc-bundle [ bundle-id ] ]
```

Views

User view

Predefined user roles

network-admin

Parameters

hdlc-bundle [*bundle-id*]: Specifies an HDLC link bundle interface by its number. The value range for this argument is 1 to 10. If you do not specify **hdlc-bundle**, this command clears the statistics of all interfaces except VA interfaces. If you specify **hdlc-bundle** but not *bundle-id*, this command clears the statistics of all HDLC link bundle interfaces. If you specify both **hdlc-bundle** and *bundle-id*, this command clears the statistics of the specified HDLC link bundle interface.

Usage guidelines

Before collecting traffic statistics within a period of time on an interface, you must clear the existing statistics.

Examples

```
# Clear the statistics of HDLC link bundle interface 1.
<Sysname> reset counters interface hdlc-bundle 1
```

Related commands

display interface hdlc-bundle

shutdown

Use **shutdown** to shut down an HDLC link bundle interface.

Use **undo shutdown** to bring up an HDLC link bundle interface.

Syntax

shutdown

undo shutdown

Default

An HDLC link bundle interface is up.

Views

HDLC link bundle interface view

Predefined user roles

network-admin

Usage guidelines

Executing this command to shut down an interface will make HDLC based on this interface become unavailable. As a best practice, make sure you fully understand the impact before executing this command.

Examples

```
# Shut down HDLC link bundle interface 1.
<Sysname> system-view
[Sysname] interface hdlc-bundle 1
[Sysname-HDLC-bundle1] shutdown
```


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Mobile communication modem management commands

This feature is supported only when the device is installed with a SIC-5G interface module.

The following compatibility matrixes show the support of the device models for mobile communication modem management.

Models	Mobile communication modem management compatibility
MSR1008	No
MSR2630E-X1	Yes
MSR3610E-X1, MSR3610E-X1-DP	Yes

Models	Mobile communication modem management compatibility
MSR2660-XS	No
MSR2680-XS	Yes

Models	Mobile communication modem management compatibility
MSR2600-12X-WiNet	No
MSR2610-13X-WiNet	Yes

Common management commands

controller cellular

Use **controller cellular** to enter cellular interface view.

Syntax

controller cellular *cellular-number*

Views

System view

Predefined user roles

network-admin

Parameters

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

Examples

Enter Cellular 2/4/0 interface view.

<Sysname> system-view

```
[Sysname] controller cellular 2/4/0
[Sysname-Cellular 2/4/0]
```

description

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

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

Syntax

description *text*

undo description

Default

The description for a cellular interface is in the *interface name Interface* format, for example, Cellular 2/4/0 Interface.

Views

Cellular interface view

Predefined user roles

network-admin

Parameters

text: Sets an interface description, a case-sensitive string of 1 to 255 characters.

Examples

```
# Set the description for Cellular 2/4/0 to Cellular-intf.
<Sysname> system-view
[Sysname] controller cellular 2/4/0
[Sysname-Cellular2/4/0] description Cellular-intf
```

display cellular

Use **display cellular** to display call connection information for a mobile communication modem.

Syntax

display cellular [*interface-number*]

Views

Any view

Predefined user roles

network-admin

network-operator

Parameters

cellular [*interface-number*]: Specifies a cellular interface by its number. If you do not specify a cellular interface, this command displays call connection information for all cellular interfaces with mobile communication modems installed.

Examples

```
# Display call connection information for a 5G modem (LTE network).
```

<sysname>display cellular 0/0

Cellular0/0:

Modem State:

Hardware Information:

Model: RM500QGL_VH

Manufacturer: QUALCOMM INCORPORATED

Modem Firmware Version: RM500QGLABR01A01M4G

International Mobile Equipment Identity (IMEI): 863305040121609

International Mobile Subscriber Identity (IMSI): 460028012255957

Hardware Version: 20000

Modem Status: Online

Modem Status: IPv4 Active.

Modem Status: IPv6 Unknown.

Profile Information:

Profile index: 1

PDP Type: IPv4v6

Header Compression: Off

Data Compression: Off

Access Point Name (APN): cmiot

Authentication: NONE

* - Default profile

Profile index: 2

PDP Type: IPv4v6

Header Compression: Off

Data Compression: Off

Access Point Name (APN): ims

Authentication: NONE

Profile index: 3

PDP Type: IPv4v6

Header Compression: Off

Data Compression: Off

Access Point Name (APN): CMNET

Authentication: NONE

Profile index: 4

PDP Type: IPv4v6

Header Compression: Off

Data Compression: Off

Access Point Name (APN): CMWAP

Authentication: NONE

Profile index: 5

PDP Type: IPv4v6

Header Compression: Off

Data Compression: Off

Access Point Name (APN): SOS

Authentication: NONE

Network Information:

Current Service Status: Service Available

Registration Status: Registered

Current Service: Combined
 Current Roaming Status: Home
 Current Data Bearer Technology = NR
 Network Selection Mode: Automatic
 Current IP address Mode: Cellular-alloc
 Current IPV6 address Mode: Unknown
 Mobile Network Name: C
 Mobile Country Code (MCC): 460
 Mobile Network Code (MNC): 00
 Tracking Area Code(TAC): 4526
 Cell ID: 20027137
 Radio Information:
 Technology Preference: No preference specified (AUTO)
 Technology Selected: NR && LTE
 Configured LTE Band =
 1,2,3,4,5,7,8,12,13,14,17,18,19,20,25,26,28,29,30,32,34,38,39,40,41,42,43
 5G availability under LTE system info:
 Current PCI: 537
 Endc Available: 1
 Restrict Dcnr: 0
 R15Availabe: 1
 NR related info:
 Current RSRQ: -12 dB
 Current RSRP: -93 dBm
 Current SNR: 14 dB
 LTE related info:
 Current RSSI: -65 dBm
 Current RSRQ: -13 dB
 Current RSRP: -103 dBm
 Current SNR: -2 dB
 Tx Power: 10 dBm
 Active Band = E-UTRA Operating Band 39
 Modem Security Information:
 PIN Verification: Disabled
 PIN Status: PIN Requirement Disabled
 Number of PIN Retries Remaining: 3
 Number of PUK Retries Remaining: 10
 SIM Status: OK
 ICCID: 898600100119F0111820
 SIM Number Information:
 SIM Number: 0
 Error Information:
 IPv4 dialing failed: 0x00: No error in the request
 IPv6 dialing failed: N/A

 GNSS Information:
 GNSS Info:
 GNSS State: Enabled
 GNSS Mode Configured: Standalone

Latitude(WGS84): 31 Deg 50 Min 21.17 Sec North
 Longitude(WGS84): 117 Deg 7 Min 47.22 Sec East
 Timestamp (UTC): 09/24/2020 01:27:26
 Local time: 09/24/2020 09:27:26
 Heading: 0.00, Velocity Horiz: 0.00, Velocity Vert: 0.00
 Height (MSL): 212.30 m
 Satellite Info:
 Satellite ID: #2
 SvSystem:GPS Elevation: 44.00, Azimuth: 309.00, SNR: 33.00, Processing Status: Track
 Satellite ID: #1
 SvSystem:BEIDOU Elevation: 61.00, Azimuth: 116.00, SNR: 40.00, Processing Status: Track
 Satellite ID: #7
 SvSystem:GALILEO Elevation: 42.00, Azimuth: 71.00, SNR: 44.00, Processing Status: Track

Table 1 Command output

Field	Description
Modem Status	Status of the modem: • Online—The modem is powered on. • Offline—The modem is powered off or in lower power mode. The cellular interface is not available. • IPv4 Active—IPv4 dialup is activated. • IPv4 Inactive—IPv4 dialup is not activated. • IPv4 Unknown—IPv4 dialup is disabled. • IPv6 Active—IPv6 dialup is activated. • IPv6 Inactive—IPv6 dialup is not activated. • IPv6 Unknown—IPv6 dialup is disabled.
PDP Type	PDP type, displayed only when Profile 1 is Active : • IPv4. • IPv6. • PPP (transparent transmission).
Header Compression	PDP header compression status: • On. • Off.
Data Compression	PDP data compression status: • On. • Off.
Authentication	Authentication mode: • NONE—No authentication. • CHAP—CHAP authentication. • PAP—PAP authentication. • PAP or CHAP—PAP or CHAP authentication.

Field	Description
Current Service Status	Service providing status of the modem: • Limited—The modem is not in the coverage of the selected network. The cellular interface is not available. • Service available—The modem is providing services correctly. • Emergency—The modem is providing limited services. The cellular interface is not available. • No service—The modem cannot provide services. The cellular interface is not available. • Low power—The modem is in low power mode. The cellular interface is not available.
Registration Status	Network registration status: • Registered—The modem has been registered to a network. • Not Registered—The modem has not been registered to a network. • Searching—The modem is searching for networks. • Denied—The modem has been denied from registration to a network. • Unknown—Other status.
Current Service	Current service status: • Combined. • Invalid. • Circuit-switched. • Packet-switched.
Current Roaming Status	Roaming status: • Roaming. • Home.
Current Data Bearer Technology	Current data carrier technology: • CDMA2000 1X. • CDMA2000 HRPD (1xEV-DO). • GSM. • UMTS. • CDMA2000 HRPD (1xEV-DO RevA). • EDGE. • HSDPA and WCDMA. • WCDMA and HSUPA. • HSDPA and HSUPA. • LTE. • NR. • CDMA2000 EHRPD. • HSDPA+ and WCDMA. • HSDPA+ and HSUPA. • DC_HSDPA+ and WCDMA. • DC_HSDPA+ and HSUPA. • HSDPA+ and 64QAM. • HSDPA+, 64QAM and HSUPA. • TDSCDMA. • TDSCDMA and HSDPA. • Unknown.

Field	Description
Network Selection Mode	Network selection mode • Manual. • Automatic.
Current IP address Mode	IPv4 address allocation method: • Cellular-alloc—Modem configuration. • dhcp-alloc—DHCP allocation. • Manual—Manual specification. • Unknown—Other allocation method.
Current IPV6 address Mode	IPv6 address allocation method: • Cellular-alloc—Modem configuration. • dhcp-alloc—DHCP allocation. • Manual—Manual specification. • Unknown—Other allocation method.
Mobile Country Code(MCC)	This information is displayed only when a network is found.
Mobile Network Code(MNC)	This information is displayed only when the modem has been registered to a network.
Tracking Area Code(TAC)	This information is displayed only when the modem has been registered to a network.
Cell ID	This information is displayed only when the modem has been registered to a network.
Radio Information	Wireless communication information
Technology Preference	Network connecting preference: • AUTO—Automatically selects a network for connection. • GSM only—Connects only to a GSM network. • GSM precedence—Connects preferentially to a GSM network. • WCDMA only—Connects only to a WCDMA network. • WCDMA precedence—Connects preferentially to a WCDMA network. • TD-SCDMA only—Connects only to a TD-SCDMA network. • TD-SCDMA precedence—Connects preferentially to a TD-SCDMA network. • EVDO—Connects only to a CDMA-EVDO network. • 1x RTT—Connects only to a CDMA-1x RTT network. • 1xRTT/EVDO HYBRID—Connects to CDMA-EVDO and CDMA-1x RTT networks simultaneously. • LTE only—Connects only to an LTE network. • NR only—Connects only to an NR network.

Field	Description
Technology Selected	Currently connected network: • GSM—Has connected to a GSM network. • WCDMA—Has connected to a WCDMA network. • TD-SCDMA—Has connected to a TD-SCDMA network. • EVDO—Has connected to a CDMA-EVDO network. • 1Xrtt—Has connected to a CDMA-1x RTT network. • 1xRTT/EVDO HYBRID—Has connected to the CDMA-EVDO and CDMA-1x RTT networks simultaneously. • LTE—Has connected to an LTE network. • NR & LTE—Has connected to an NR+LTE network (NSA networking) • NR—Has connected to an NR network.
5G availability under LTE system info	5G base station settings configured in NSA networking.
Current PCI	Current physical cell ID.
Endc Available	Whether 5G services are available (indicated by the SIB2 message).
Restrict Dcnr	Whether the modem can connect to both LTE and NR base stations.
R15Availabe	Whether R15 can be used (indicated by the PLMN message of the base station).
Current RSRQ	Current reference signal received quality.
Current RSRP	Current reference signal received power.
Current SNR	Current signal-to-noise ratio.
Current RSSI	The value is in the range of –110 dBm to –51 dBm. This field displays Unknown when no signal is received and the cellular interface is not available.
Tx Power	Signal transmit power.
Active Band	Band No. of the base station.
PIN Verification	PIN authentication status: • Disabled. • Enabled. • Unknown.
PIN Status	• Ready—The SIM card is normal. • PIN Requirement—Requires you to execute the pin verify command to enter the PIN for PIN verification. • PUK Requirement—Requires you to execute the pin unlock command to unlock the SIM or UIM card.
Number of PIN Retries Remaining	Remaining retries available for entering the PIN.
Number of PUK Retries Remaining	Remaining retries available for entering the PUK.

Field	Description
SIM Status	SIM card status: OK—The SIM card is normal. Locked—The SIM card is locked. The cellular interface is not available. Not Inserted—No SIM card is present. The cellular interface is not available Unknown—The SIM card status is unknown.
ICCID	ID of the SIM card, displayed only when the SIM card status is OK .
SIM Number Information	Slot information for the active SIM card.
SIM Number	Slot number for the active SIM card. The available values are 0 and 1.
IPv4 dialing failed	The system returns 0x00 if IPv4 dialup failed and displays N/A if no IPv4 dialup is performed.
IPv6 dialing failed	The system returns 0x00 if IPv6 dialup failed and displays N/A if no IPv6 dialup is performed.

display controller cellular

Use **display controller cellular** to display information about cellular interfaces.

Syntax

```
display controller [ cellular [ interface-number ] ]
```

Views

Any view

Predefined user roles

network-admin
network-operator

Parameters

cellular [*interface-number*]: Specifies cellular interfaces or a cellular interface by its number. If you do not specify the **cellular** keyword, this command displays information about all interfaces. If you specify the **cellular** keyword but not the *interface-number* argument, this command displays information about all cellular interfaces.

Examples

```
# Display information about Cellular 2/4/0.
<Sysname> display controller cellular 2/4/0
Cellular2/4/0
Current state: UP
Description: Cellular2/4/0 Interface
Modem status: Present
DM port status: Disabled
Capability:
  1 Control channel, 1 PPP channel
Control channel 0 traffic statistics:
  TX: 0 packets, 0 errors
  RX: 0 packets, 0 errors
```

PPP channel 0 traffic statistics:

TX: 0 packets, 0 errors

RX: 0 packets, 0 errors

Table 2 Command output

Field	Description
Cellular2/4/0 Current state	Status of the interface: • DOWN(Administratively)—The interface has been administratively shut down by using the shutdown command. • DOWN—The interface is administratively up but its physical state is down, possibly because of a connection or link failure. • UP—The administrative and physical states of the interface are both up.
Description	Description of the interface.
Modem status	This field is not supported in the current software version. Status of the USB mobile communication modem: • Present—The modem is present. • Absent—The modem is absent.
DM port status	DM status: • Enabled. • Disabled.
Capability: 1 Control channel, 1 PPP channel	Type and number of channels the cellular interface supports: • 1 Control channel—Supports one control channel. • 1 PPP channel—Supports one asynchronous serial subchannel. • 1 ETH channel—Supports one Ethernet subchannel.
Control channel 0 traffic statistics: TX: 0 packets, 0 errors RX: 0 packets, 0 errors	Control channel statistics: • TX: 0 packets, 0 errors—Number of packets and number of error packets sent through the control channel. • RX: 0 packets, 0 errors—Number of packets and number of error packets received through the control channel.
PPP channel 0 traffic statistics TX: 0 packets, 0 errors RX: 0 packets, 0 errors	PPP channel statistics: • TX: 0 packets, 0 errors—Number of packets and number of error packets sent through the PPP channel. • RX: 0 packets, 0 errors—Number of packets and number of error packets received through the PPP channel.
ETH channel 0 traffic statistics TX: 0 packets, 0 errors RX: 0 packets, 0 errors	Ethernet channel statistics: • TX: 0 packets, 0 errors—Number of packets and number of error packets sent through the Ethernet channel. • RX: 0 packets, 0 errors—Number of packets and number of error packets received through the Ethernet channel.

Related commands

reset counters controller cellular

dm-port open

Use **dm-port open** to enable diagnostic and monitoring (DM) on a mobile communication modem.

Use **undo dm-port open** to disable DM on a mobile communication modem.

Syntax

dm-port open

undo dm-port open

Default

The default setting for this command depends on the modem model.

Views

Cellular interface view

Predefined user roles

network-admin

Usage guidelines

Enabling DM on a mobile communication modem allows third-party debugging tools to diagnose and monitor the mobile communication modem through cellular interface debugging output.

Examples

Enable DM on a mobile communication modem.

<Sysname> system-view

[Sysname] controller cellular 2/4/0

[Sysname-Cellular2/4/0] dm-port open

mode

Use **mode** to specify the network connection preference.

Syntax

mode { auto | lte | nr | wcdma | wcdma-precedence }

Default

The default setting for this command depends on the modem model.

Views

Cellular interface view

Predefined user roles

network-admin

Parameters

auto: Connects to a network automatically.

lte: Connects only to an LTE network.

nr: Connects only to an NR network.

wcdma: Connects only to a WCDMA network.

wcdma-preference: Connects to a WCDMA network preferentially.

Usage guidelines

The available parameters depend on the modem model.

Specify the **nr** keyword with caution. On an NSA network, if you specify the **nr** keyword for the modem to connect only to an NR network, the modem might fail to connect to the Internet.

Examples

```
# Specify the LTE service for the 5G modem.
<Sysname> system-view
[Sysname] controller cellular 2/4/0
[Sysname-Cellular2/4/0] mode lte
```

modem reboot

Use **modem reboot** to reboot a mobile communication modem.

Syntax

modem reboot

Views

Cellular interface view

Predefined user roles

network-admin

Usage guidelines



CAUTION:

Execute this command with caution. It will disconnect the established modem connections.

A mobile communication modem module can automatically detect running errors and reboot. If the mobile communication modem fails to reboot by itself, you can use this command to reboot it.

Examples

```
# Manually reboot the mobile communication modem.
<Sysname> system-view
[Sysname] controller cellular 2/4/0
[Sysname-Cellular2/4/0] modem reboot
```

modem response

Use **modem response** to set a mobile communication modem response timer and a consecutive response failure threshold for auto recovery.

Use **undo modem response** to restore the default.

Syntax

modem response timer *time* **auto-recovery** *threshold*
undo modem response

Default

The response timer is 10 seconds and the consecutive response failure threshold is 3.

Views

Cellular interface view

Predefined user roles

network-admin

Parameters

timer *time*: Sets the response timer, in the range of 1 to 300, in seconds.

auto-recovery *threshold*: Specifies the consecutive response failure threshold for auto recovery. The value range for the *threshold* argument is 0 to 10. To disable auto recovery, set the value to 0.

Usage guidelines

A mobile communication modem might malfunction in an unstable mobile communication network or when the application environment changes. During a malfunction, the modem cannot respond to the device's requests or configuration commands. If the device does not receive any responses from the mobile communication modem before the timer times out, a response failure occurs. When the number of consecutive response failures reaches the threshold, the device restarts the mobile communication modem automatically. This releases the user from manually rebooting the modem.

The device does not restart the mobile communication modem when the mobile communication modem has not made a successful dialup since the last restart. This restriction avoids repeated restarts of the mobile communication modem when there are configuration errors.

Examples

```
# Set the response timer to 20 seconds and the consecutive response failure threshold for auto recovery to 4.
```

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

```
[Sysname] controller cellular 2/4/0
```

```
[Sysname-Cellular2/4/0] modem response timer 20 auto-recovery 4
```

pin modify

Use **pin modify** to modify the PIN of a SIM/UIM card.

Syntax

pin modify *current-pin new-pin*

Views

Cellular interface view

Predefined user roles

network-admin

Parameters

current-pin: Specifies the current PIN of the SIM/UIM card, a string of 4 to 8 digits.

new-pin: Specifies the new PIN, a string of 4 to 8 digits.

Usage guidelines

The new PIN is saved on the SIM/UIM card.

If PIN verification is enabled, execute the **pin verify** command to save the new PIN on the device after the PIN is modified.

Failure to modify the PIN in a maximum number of attempts locks the SIM/UIM card. The maximum number of attempts depend on the mobile communication modem model. To unlock the card, execute the **pin unlock** command.

For some mobile communication modems, you can modify their PINs only when the mobile communication modems pass the PIN authentication.

Examples

```
# Modify the PIN of a SIM/UIM card.
<Sysname> system-view
[Sysname] controller cellular 2/4/0
[Sysname-Cellular2/4/0] pin modify 1234 4321
PIN will be changed to "4321". Continue? [Y/N]:y
PIN has been changed successfully.
```

Related commands

pin unlock
pin verification enable
pin verify

pin unlock

Use **pin unlock** to specify the Personal Unlock Code (PUK) to unlock a SIM/UIM card.

Syntax

pin unlock *puk new-pin*

Views

Cellular interface view

Predefined user roles

network-admin

Parameters

puk: Specifies the PUK of the SIM/UIM card, a string of 4 to 8 digits. The PUK code of a SIM/UIM card is provided by the network service provider.

new-pin: Specifies the new PIN, a string of 4 to 8 digits.

Usage guidelines

A SIM/UIM card will be locked in the following circumstances:

- Consecutive PIN modification failures.
- Consecutive failures for enabling or disabling PIN authentication.
- Consecutive PIN authentication failures.

If the SIM/UIM card is locked, the modem cannot be used. To unlock the card, you can use the **pin unlock** command. The new PIN is saved on the SIM/UIM card.

If PIN verification is enabled, use the **pin verify** command to save the new PIN on the device after the SIM/UIM card is unlocked.

If you consecutively fail to unlock a card by using the PUK, the card will be locked permanently. To unlock a permanently locked card, contact the service provider of the card.

Examples

```
# Use the PUK to unlock a SIM/UIM card.
<Sysname> system-view
[Sysname] controller cellular 2/4/0
[Sysname-Cellular2/4/0] pin unlock 87654321 1234
```

PIN will be unlocked and changed to "1234". Continue? [Y/N]:y
PIN has been unlocked and changed successfully.

Related commands

pin modify

pin verification enable

pin verification enable

Use **pin verification enable** to enable PIN verification for a mobile communication modem.

Use **undo pin verification enable** to disable PIN verification for a mobile communication modem.

Syntax

pin verification enable [*pin*]

undo pin verification enable [*pin*]

Default

The default setting for this command depends on the modem model.

Views

Cellular interface view

Predefined user roles

network-admin

Parameters

pin: Specifies the PIN of the SIM/UIM card, a string of 4 to 8 digits.

Usage guidelines

If PIN verification is enabled, PIN verification is performed after you perform any of the following tasks:

- Install a mobile communication modem.
- Reboot the mobile communication modem.
 - Reboot the device.
 - Execute the **modem reboot** command to reboot the modem.
 -

To perform PIN verification, you also need to execute the **pin verify** command to save the PIN of the SIM/UIM card on the device. After the PIN is saved on the device, the PIN is used for verification automatically when required.

You might be required to provide the current PIN when you enable or disable PIN verification. Consecutive failures for enabling or disabling PIN verification lock a SIM/UIM card. To unlock the card, execute the **pin unlock** command.

For some mobile communication modems, you can disable PIN verification only when the mobile communication modems pass PIN authentication.

Examples

Enable PIN authentication.

<Sysname> system-view

[Sysname] controller cellular 2/4/0

[Sysname-Cellular2/4/0] pin verification enable 1234

Related commands

pin unlock
pin verify

pin verify

Use **pin verify** to specify the PIN of a SIM/UIM card on a mobile communication modem.

Use **undo pin verify** to restore the default.

Syntax

pin verify { **cipher** | **simple** } *string*
undo pin verify

Default

No PIN is specified for a SIM/UIM card.

Views

Cellular interface view

Predefined user roles

network-admin

Parameters

cipher *ciphered-pin*: Specifies a PIN in encrypted form.

simple *pin*: Specifies a PIN in plaintext form. For security purposes, the PIN specified in plaintext form will be stored in encrypted form.

string: Specifies the PIN. Its plaintext form is 4 to 8 digits long. Its encrypted form is a string of 37 to 41 characters.

Usage guidelines

This command saves the PIN of the SIM/UIM card on the device. The PIN is used for verifying the mobile communication modem when PIN verification is performed. You can execute this command before or after you enable PIN verification.

Consecutive PIN verification failures might lock a SIM/UIM card. To unlock the card, execute the **pin unlock** command.

Examples

```
# Specify the plaintext form PIN 1234 for the SIM/UIM card.  
<Sysname> system-view  
[Sysname] controller cellular 2/4/0  
[Sysname-Cellular2/4/0] pin verify simple 1234
```

Related commands

pin unlock
pin verification enable

plmn search

Use **plmn search** to search for available mobile networks.

Syntax

plmn search

Views

Cellular interface view

Predefined user roles

network-admin

Usage guidelines

Before you use a mobile communication modem to access a mobile network, use the **plmn search** command to search a PLMN for available mobile networks. The search takes a few minutes. After the search is complete, the CLI displays the available mobile networks. Some mobile communication modems automatically access an available network. You can also specify a mobile network for the mobile communication modem from the available mobile networks.

Examples

```
# Search for mobile networks on Cellular 2/4/0.
```

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

```
[Sysname] controller cellular 2/4/0
```

```
[Sysname-Cellular2/4/0] plmn search
```

```
PLMN search done.
```

```
Available PLMNs:
```

PLMN No.	MCC	MNC	Status	Type
01	460	00	Current	GSM
02	460	00	Available	UTRAN
03	460	01	Forbidden	GSM

Table 3 Command output

Field	Description
PLMN No	PLMN number.
MCC	Mobile Country Code.
MNC	Mobile Network Code: • 00, 02, and 07—China Mobile. • 01—China Unicom. • 03—China Telecom.
Status	Status of the mobile network: • Current. • Available. • Forbidden.
Type	Type of the mobile network.

Related commands

display cellular

plmn select

plmn select

Use **plmn select** to configure the mobile network selection mode.

Syntax

```
plmn select { auto | manual mcc mnc }
```

Default

The default setting for this command depends on the modem model.

Views

Cellular interface view

Predefined user roles

network-admin

Parameters

auto: Specifies the auto selection mode. The modem automatically selects a mobile network.

manual: Specifies the manual selection mode.

mcc: Specifies the mobile country code (MCC) in the range of 0 to 65535.

mnc: Specifies the mobile network code (MNC) in the range of 0 to 65535.

Usage guidelines

For manual selection, you can first use the **plmn search** command to obtain the MCC and MNC of a mobile network.

Examples

```
# Manually specify a mobile network.  
<Sysname> system-view  
[Sysname] controller cellular 2/4/0  
[Sysname-Cellular2/4/0] plmn select manual 65524 65524
```

Related commands

display cellular

plmn search

reset counters controller cellular

Use **reset counters controller cellular** to clear statistics on cellular interfaces.

Syntax

```
reset counters controller cellular [ interface-number ]
```

Views

User view

Predefined user roles

network-admin

Parameters

cellular [*interface-number*]: Specifies cellular interfaces or a cellular interface by its number. If you do not specify the *interface-number* argument, this command clears statistics

on all cellular interfaces. If you specify the *interface-number* argument, this command clears statistics on the specified cellular interface.

Usage guidelines

To collect traffic statistics on an interface during a period of time, first use the **reset counters controller cellular** command to clear the existing statistics on the interface.

Examples

```
# Clear statistics on Cellular 2/4/0.  
<Sysname> reset counters controller cellular 2/4/0
```

Related commands

display controller cellular

rsSi

Use **rsSi** to set the RSSI thresholds for a mobile communication modem.

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

Syntax

```
rsSi { 1xrtt | evdo | gsm | lte } { low lowthreshold | medium mediumthreshold }  
*  
undo rsSi { 1xrtt | evdo | gsm | lte } [ low | medium ]
```

Default

The lower and upper RSSI thresholds for a mobile communication modem are -150 dBm and 0 dBm, respectively.

Views

Cellular interface view

Predefined user roles

network-admin

Parameters

1xrtt: Specifies the 1xRTT mode.

evdo: Specifies the EVDO mode.

gsm: Specifies the GSM mode.

lte: Specifies the LTE mode.

low *lowthreshold*: Specifies the lower RSSI threshold value in the range of 0 to 150, which represents a lower RSSI threshold in the range of -150 dBm to 0 dBm. The value of *lowthreshold* cannot be smaller than the value of *mediumthreshold* because the system automatically adds a negative sign to the RSSI thresholds.

medium *mediumthreshold*: Specifies the upper RSSI threshold value in the range of 0 to 150, which represents an upper RSSI threshold in the range of -150 dBm to 0 dBm.

Usage guidelines

The device performs the following operations based on the actual RSSI of the mobile communication modem:

- Sends a trap that indicates high RSSI when the RSSI exceeds the upper threshold.

- Sends a trap that indicates normal RSSI when the RSSI is between the lower threshold and upper threshold (included).
- Sends a trap that indicates low RSSI when the RSSI drops to or below the lower threshold.
- Sends a trap that indicates low RSSI every 10 minutes when the RSSI remains equal to or smaller than the lower threshold.

To view the RSSI change information for a mobile communication modem, use the **display cellular** command.

Examples

```
# Set the lower threshold for a mobile communication modem in GSM mode to -110 dBm.
<Sysname> system-view
[Sysname] controller cellular 0/0
[Sysname-Cellular0/0] rssi gsm low 110
```

sendat

Use **sendat** to issue a configuration directive to a mobile communication modem.

Syntax

sendat *at-string*

Views

Cellular interface view

Predefined user roles

network-admin

Parameters

at-string: Specifies a configuration directive string, a string of 1 to 300 characters. This argument can be an AT directive (containing **+++**, **A/**, or be any string beginning with **AT**) or a CNS directive. For more information about AT directives, see the **sendat** command in *Layer 2—WAN Access Command Reference*. [Table 4](#) describes the CNS directive samples. The format of this argument depends on the modem model.

Table 4 CNS directive description

Directive	Description
CNS_n	Controls the CNS heartbeat debugging switch. • n = 00000500000000000000—Enables CNS heartbeat debugging. • n = 00000800000000000000—Disables CNS heartbeat debugging.

Usage guidelines

The **sendat** command does not verify the configuration directive. Each time it issues one configuration directive to the mobile communication modem, lowercase characters are automatically converted to uppercase characters.

One **sendat** command issues one configuration directive. To issue multiple configuration directives to a modem, you must repeat the **sendat** command.

Configuration directives might cause malfunction of a mobile communication modem. When you issue a configuration directive to the modem, make sure you understand the impact on the mobile communication modem.

Examples

```
# Issue the ATD169 directive to the mobile communication modem to call number 169.
<Sysname> system-view
[Sysname] controller cellular 2/4/0
[Sysname-Cellular2/4/0] sendat ATD169

# Issue the cns00000500000000000000 directive to the mobile communication modem to enable
CNS heartbeat debugging.
<Sysname> system-view
[Sysname] controller cellular 2/4/0
[Sysname-Cellular2/4/0] sendat cns000005000000000000000000
```

shutdown

Use **shutdown** to shut down a cellular interface.

Use **undo shutdown** to bring up a cellular interface.

Syntax

shutdown

undo shutdown

Default

The cellular interface is up.

Views

Cellular interface view

Predefined user roles

network-admin

Examples

```
# Shut down Cellular 2/4/0.
<Sysname> system-view
[Sysname] interface cellular 2/4/0
[Sysname-Cellular2/4/0] shutdown
```

sim backup enable track

Use **sim backup enable track** to associate mobile communication link backup with a track entry.

Use **undo sim backup enable** to restore the default.

Syntax

sim backup enable track *entry-number*

undo sim backup enable

Default

Mobile communication link backup is not associated with a track entry.

Views

Cellular interface view

Predefined user roles

network-admin

Parameters

entry-number: Specifies a track entry by its ID in the range of 1 to 1024.

Usage guidelines

This command uses a track entry to monitor the status of the primary mobile communication link. When the track entry state changes from Positive to Negative, the secondary mobile communication link takes over. For information about track entries, see track configuration in *High Availability Configuration Guide*.

You can associate only one track entry with a mobile communication link. If you execute this command multiple times, the most recent configuration takes effect.

The association takes effect only after the track entry is created.

Examples

```
# Associate Cellular 1/0 with track entry 1.
<sysname> system
[system] controller cellular 1/0
[system-Cellular1/0] sim backup enable track 1
```

Related commands

sim switch-back enable

sim switch-to

sim switch-back enable

Use **sim switch-back enable** to enable automatic switchback to the primary SIM card.

Use **undo sim switch-back enable** to disable automatic switchback to the primary SIM card.

Syntax

```
sim switch-back enable [ wait-time time ]
undo sim switch-back enable
```

Default

Automatic switchback to the primary SIM card is disabled.

Views

Cellular interface view

Predefined user roles

network-admin

Parameters

time: Specifies the length of time for using the secondary SIM card. The value is in the range of 1 to 65535, in minutes. The default value is 60. After the time expires, the device automatically switches back to the primary SIM card.

Usage guidelines

This command allows the device to automatically switch back to the primary SIM card after the specified length of time for using the secondary SIM card. To avoid frequent primary/secondary switchovers, make sure the link of the primary SIM card can recover after the specified length of time.

Examples

```
# Enable the device to automatically switch back to the primary SIM card after 100 minutes of using
the secondary SIM card.
<Sysname> system-view
[Sysname] controller cellular 1/0
[Sysname-Cellular1/0] sim switch-back enable wait-time 100
```

sim switch-to

Use **sim switch-to** to specify the primary or secondary SIM card.

Syntax

```
sim switch-to card-number
```

Default

The primary SIM card is used.

Views

Cellular interface view

Predefined user roles

network-admin

Parameters

card-number: Specifies a SIM card by its slot number. The value is 0 or 1. 0 represents the primary SIM card. 1 represents the secondary SIM card.

Usage guidelines



CAUTION:

This command might cause traffic interruption. Be aware of the impact of this command before executing it.

On a device that uses dual SIM card, you can execute this command to specify the use of the secondary SIM card when one of the following problems occurs:

- The mobile communication link signals of the primary SIM card are weak.
- The service provider network that the primary SIM card connects to is unavailable.
- The primary SIM card has failed.

If the problems of the primary SIM card are resolved, you can use this command to specify the use of the primary SIM card.

Examples

```
# Specify the secondary SIM card for the device.
<Sysname> system-view
[Sysname] controller cellular 1/0
[Sysname-Cellular1/0] sim switch-to 1
```

trust-imsi

Use **trust-imsi** to configure a trusted IMSI.

Use **undo trust-imsi** to remove a trusted IMSI.

Syntax

```
trust-imsi string-imsi  
undo trust-imsi [ string-imsi ]
```

Default

No trusted IMSI is configured.

Views

Cellular interface view

Predefined user roles

network-admin

Parameters

string-imsi: Specifies an IMSI. The *string-imsi* argument is a case-insensitive string of 1 to 31 characters.

Usage guidelines

For a successful dialup, configure the IMSI of the SIM card as a trusted IMSI.

You can configure a maximum of 16 trusted IMSIs.

Examples

```
# Configure trusted IMSI hccc123456789 for Cellular 0/0.  
<Sysname> system-view  
[Sysname] controller cellular 0/0  
[Sysname-Cellular0/0] trust-imsi hccc123456789
```

wcdma band

Use **wcdma band** to specify a WCDMA band.

Use **undo wcdma band** to restore the default.

Syntax

```
wcdma band { wcdma800 | wcdma850 | wcdma900 | wcdma1700ip | wcdma1700us |  
wcdma1800 | wcdma1900 | wcdma2100 | wcdma2600 }  
undo wcdma band
```

Default

No WCDMA band is specified.

Views

Cellular interface view

Predefined user roles

network-admin

Parameters

wcdma800: Specifies the WCDMA 800 MHz band.

wcdma850: Specifies the WCDMA 850 MHz band.

wcdma900: Specifies the WCDMA 900 MHz band.

wcdma1700jp: Specifies the Japan WCDMA 1700 MHz band.

wcdma1700us: Specifies the US WCDMA 1700 MHz band.

wcdma1800: Specifies the WCDMA 1800 MHz band.

wcdma1900: Specifies the WCDMA 1900 MHz band.

wcdma2100: Specifies the WCDMA 2100 MHz band.

wcdma2600: Specifies the WCDMA 2600 MHz band.

Usage guidelines

Multiple frequency bands are available for accessing the WCDMA network. When the network environment changes, the modem might change the working band automatically to adapt to the change. To avoid link instability caused by frequency changes, you can specify a WCDMA band for the modem.

Examples

```
# Specify the WCDMA 1700 MHz band for the modem.  
<Sysname> system-view  
[Sysname] controller cellular 0/0  
[Sysname-Cellular0/0] wcdma band wcdma1700
```

Related commands

gsm band

lte band

5G modem-specific management commands

apn

Use **apn** to specify an access point name (APN) for a 5G modem.

Use **undo apn** to remove an APN.

Syntax

apn { dynamic | static *apn* }

undo apn

Default

No APN is specified for a 5G modem.

Views

5G modem profile view

Predefined user roles

network-admin

Parameters

dynamic: Uses an APN automatically assigned by the service provider.

static *apn*: Specifies the APN provided by the service provider. The *apn* argument is a string of 1 to 100 characters. Whether the string is case-sensitive depends on the service provider.

Examples

```
# Specify APN apn1 for 5G modem profile test.  
<Sysname> system-view
```

```
[Sysname] apn-profile test
[Sysname-apn-profile-test] apn static apn1
```

Related commands

apn-profile

apn-profile

Use **apn-profile** to create a 5G modem profile.

Use **undo apn-profile** to remove a 5G modem profile.

Syntax

```
apn-profile profile-name
undo apn-profile profile-name
```

Default

No 5G modem profile exists.

Views

System view

Predefined user roles

network-admin

Parameters

profile-name: Specifies a 5G modem profile name.

Usage guidelines

A 5G modem profile takes effect only after you apply the profile to an Eth-channel interface. To remove a 5G modem profile, you must first cancel the application.

Examples

```
# Create 5G modem profile test.
<Sysname> system-view
[Sysname] apn-profile test
```

Related commands

apn-profile apply

apn-profile apply

Use **apn-profile apply** to specify 5G modem profiles for an Eth-channel interface.

Use **undo apn-profile apply** to restore the default.

Syntax

```
apn-profile apply profile-name [ backup profile-name ]
undo apn-profile apply
```

Default

No 5G modem profiles are specified for an Eth-channel interface.

Views

Eth-channel interface view

Predefined user roles

network-admin

Parameters

profile-name: Specifies a primary 5G modem profile name.

backup profile-name: Specifies a backup 5G modem profile name.

Usage guidelines

After you specify a 5G modem profile for a 5G modem, the 5G modem uses the settings in the profile to negotiate with the service provider's device.

A primary profile always has priority over a backup profile. For each dialup connection establishment, the 5G modem uses the backup profile only when it has failed to dial up using the primary profile.

This command takes effect only on dialup connections initiated after the command is configured. It does not take effect on a dialup connection that has been established.

Examples

```
# Specify primary 5G modem profile test and backup 5G modem profile bktest for Eth-channel interface 2/4/0:0.
```

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

```
[Sysname] interface eth-channel 2/4/0:0
```

```
[Sysname-Eth-channel2/4/0:0] apn-profile apply test backup bktest
```

Related commands

apn-profile

attach-format imsi-sn split

Use **attach-format imsi-sn split** to specify a delimiter for the IMSI/SN binding authentication information.

Use **undo attach-format imsi-sn split** to restore the default.

Syntax

attach-format imsi-sn split *splitchart*

undo attach-format imsi-sn split

Default

No delimiter is specified for the IMSI/SN binding authentication information.

Views

5G modem profile view

Predefined user roles

network-admin

Parameters

split splitchart: Specifies a delimiter. It can be a letter, a digit, or a sign such as a percent sign (%) or a pound sign (#).

Usage guidelines

If IMSI/SN binding authentication is enabled, the IMSI/SN information is included in the authentication information in addition to the username. You need to configure a delimiter to separate different types of information. For example, if you specify the delimiter as #, the authentication information will be sent in the imsiinfo#sninfo#username format.

Examples

```
# Configure the pound sign (#) as the delimiter for the IMSI/SN binding authentication information.
<Sysname> system-view
[Sysname] apn-profile test
[Sysname-apn-profile-test] attach-format imsi-sn split #
```

Related commands

apn-profile

authentication-mode

Use **authentication-mode** to specify an authentication mode for accessing a 5G network.

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

Syntax

```
authentication-mode { pap | chap | pap-chap } user user-name password
{ cipher | simple } string
undo authentication-mode
```

Default

No authentication mode is specified for accessing a 5G network.

Views

5G modem profile view

Predefined user roles

network-admin

Parameters

chap: Specifies CHAP authentication.

pap: Specifies PAP authentication.

pap-chap: Specifies CHAP or PAP authentication.

user *username*: Specifies the username for authentication, a case-sensitive string of 1 to 32 characters.

cipher: Specifies a password in encrypted form.

simple: Specifies a password in plaintext form. For security purposes, the password specified in plaintext form will be stored in encrypted form.

string: Specifies the password. Its plaintext form is a case-sensitive string of 1 to 32 characters. Its encrypted form is a case-sensitive string of 1 to 73 characters.

Examples

```
# Specify the CHAP authentication mode for 5G modem profile test. Specify the username as user1
and the password as 123456.
<Sysname> system-view
[Sysname] apn-profile test
[Sysname-apn-profile-test] authentication-mode chap user user1 password simple 123456
```

Related commands

apn-profile

bandwidth

Use **bandwidth** to configure the expected bandwidth for an Eth-channel 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

Eth-channel 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 for 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 for Eth-channel 2/4/0:0 to 1000 kbps.
<Sysname> system-view
[Sysname] interface eth-channel 2/4/0:0
[Sysname-Eth-channel2/4/0:0] bandwidth 1000
```

default

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

Syntax

default

Views

Eth-channel 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 impact 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. Then, use their **undo** forms or follow the command reference to

individually restore their default settings. If your restoration attempt fails, follow the error message instructions to resolve the problem.

Examples

```
# Restore the default settings for Eth-channel 2/4/0:0.
<Sysname> system-view
[Sysname] interface eth-channel 2/4/0:0
[Sysname-Eth-channel2/4/0:0] default
```

description

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

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

Syntax

```
description text
undo description
```

Default

The description for an interface is in the *interface name* Interface format, for example, Echannel2/4/0:0 Interface.

Views

Eth-channel interface view

Predefined user roles

network-admin

Parameters

text: Sets an interface description, a case-sensitive string of 1 to 255 characters.

Usage guidelines

Configure the description of an interface for easy identification and management purposes.

You can use the **display interface** command to view the description for an interface.

Examples

```
# Configure the description for Eth-channel 2/4/0:0 as Echannel-interface.
<Sysname> system-view
[Sysname] interface eth-channel 2/4/0:0
[Sysname-Eth-channel2/4/0:0] description Echannel-interface
```

display interface eth-channel

Use **display interface eth-channel** to display information about the specified or all Eth-channel interfaces.

Syntax

```
display interface [ eth-channel [ channel-id ] ] [ brief [ description | down ] ]
```

Views

Any view

Predefined user roles

network-admin
network-operator

Parameters

eth-channel [*channel-id*]: Specifies Eth-channel interfaces or an Eth-channel interface by its number. If you do not specify the **eth-channel** keyword, the command displays information about all interfaces. If you specify the **eth-channel** keyword but not the *channel-id* argument, this command displays information about all Eth-channel interfaces.

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.

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

Examples

Display detailed information about Eth-channel 2/4/0:0, including its operating status.

```
<Sysname> display interface eth-channel 2/4/0:0
Echannel2/4/0:0
Current state: DOWN
Line protocol state: DOWN
Description: Echannel2/4/0:0 Interface
Bandwidth: 100000kbps
Maximum Transmit Unit: 1500
Internet protocol processing: disabled
IP Packet Frame Type:PKTFMT_ETHNT_2, Hardware Address: 000c-2963-b75d
IPv6 Packet Frame Type:PKTFMT_ETHNT_2, Hardware Address: 000c-2963-b75d
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 link flapping: Never
Last clearing of counters: Never
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
```

Display brief information about Eth-channel 2/4/0:0.

```
<Sysname> display interface eth-channel 2/4/0:0 brief
Brief information on interface(s) under route mode:
Link: ADM - administratively down; Stby - standby
Protocol: (s) - spoofing

```

Interface	Link	Protocol	Main IP	Description
Echannel2/4/0:0	UP	UP(s)	192.168.80.239	

Display information about all Eth-channel interfaces in down state and the causes.

```
<Sysname> display interface eth-channel brief down
Brief information on interface(s) under route mode:
Link: ADM - administratively down; Stby - standby
```

Interface Link Cause
Echannel2/4/0:0 ADM Administratively

Table 5 Command output

Field	Description
Current state	Physical link state of the interface: • Administratively DOWN—The interface has been shut down by using the shutdown command. • DOWN—The interface is administratively up, but its physical state is down (possibly because no physical link exists or the link has failed). • UP—The interface is both administratively and physically up.
Line protocol state	Data link layer state of the interface. The state is determined through automatic parameter negotiation at the data link layer. • UP—The data link layer protocol is up. • UP (spoofing)—The data link layer protocol is up, but the link is an on-demand link or does not exist. This attribute is typical of null interfaces and loopback interfaces. • DOWN—The data link layer protocol is down.
Description	Description for the interface.
Bandwidth	Expected bandwidth of the interface.
Maximum Transmit Unit	MTU of the interface.
Internet address: <i>ip-address/mask-length (Type)</i>	IP address of the interface and type of the address in parentheses. Possible IP address types include: • Primary—Manually configured primary IP address. • Sub—Manually configured secondary IP address. If the interface has both primary and secondary IP addresses, the primary IP address is displayed. If the interface has only secondary IP addresses, the lowest secondary IP address is displayed. • DHCP-allocated—DHCP allocated IP address. For more information, see DHCP client configuration in <i>Layer 3—IP Services Configuration Guide</i>. • BOOTP-allocated—BOOTP allocated IP address. For more information, see BOOTP client configuration in <i>Layer 3—IP Services Configuration Guide</i>. • PPP-negotiated—IP address assigned by a PPP server during PPP negotiation. For more information, see PPP configuration in <i>Layer 2—WAN Access Configuration Guide</i>. • Unnumbered—IP address borrowed from another interface. • Cellular-allocated—IP address allocated through the modem-manufacturer's proprietary protocol. For more information, see mobile communication modem management in <i>Layer 2—WAN Access Configuration Guide</i>. • MTunnel—IP address of the multicast tunnel interface (MTI), which is the same as the IP address of the MD source interface. For more information, see multicast VPN configuration in <i>IP Multicast Configuration Guide</i>.
Internet protocol processing: disabled	The interface is not assigned an IP address and cannot process IP packets.
Internet Address is 192.168.1.200/24 Primary	IP address of the interface. The primary attribute indicates that the address is the primary IP address..
IP Packet Frame Type	IPv4 packet framing format.

Field	Description
Hardware Address	MAC address of the interface.
IPv6 Packet Frame Type	IPv6 packet framing format.
Output queue - Urgent queuing: Size/Length/Discards	Packet statistics for urgent queuing in the output queue of the interface: • Size—Current number of packets in the queue. • Length—Maximum number of packets that can stay in the queue. • Discards—Number of dropped packets.
Output queue - Protocol queuing: Size/Length/Discards	Packet statistics for protocol queuing in the output queue of the interface: • Size—Current number of packets in the queue. • Length—Maximum number of packets that can stay in the queue. • Discards—Number of dropped packets.
Output queue - FIFO queuing: Size/Length/Discards	Packet statistics for FIFO queuing in the output queue of the interface: • Size—Current number of packets in the queue. • Length—Maximum number of packets that can stay in the queue. • Discards—Number of dropped packets.
Last link flapping	The amount of time that has elapsed since the most recent physical state change of the interface. This field displays Never if the interface has been physically down since device startup.
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 rate	Average input rate during the last 300 seconds: • bytes/sec—Average number of received bytes per second. • bits/sec—Average number of received bits per second. • packets/sec—Average number of received packets per second.
Last 300 seconds output rate	Average output rate over the last 300 seconds: • bytes/sec—Average number of sent bytes per second. • bits/sec—Average number of sent bits per second. • packets/sec—Average number of sent packets per second.
Input: 0 packets, 0 bytes, 0 buffers	Incoming packet statistics: • 0 packets—Packet number. • 0 bytes—Packet size in bytes. • 0 buffers—Number of buffered units.
Output: 0 packets, 0 bytes	Outgoing packet statistics: • 0 packets—Packet number. • 0 bytes—Packet size in bytes.

Field	Description
Link	Physical link state of the interface: UP—The interface is physically up. DOWN—The interface is physically down. ADM—The interface has been shut down by using the shutdown command. To restore the physical state of the interface, use the undo shutdown command. Stby—The interface is a backup interface in standby state. To see the primary interface, use the display interface-backup state command.
Protocol	Data link layer protocol state of the interface: UP—The data link layer protocol of the interface is up. DOWN—The data link layer protocol of the interface is down. UP(s)—The data link layer protocol of the interface is up, but the link is an on-demand link or does not exist. The (s) attribute represents the spoofing flag. This value is typical of null interfaces and loopback interfaces.
Main IP	Main IP address of the interface.
Description	Description of the interface.
Cause	Cause for the physical link state of the interface to be DOWN . Administratively represents that the interface has been manually shut down by using the shutdown command. To restore the physical state of the interface, use the undo shutdown command.

eth-channel

Use **eth-channel** to channelize a cellular interface into an Eth-channel interface.

Use **undo eth-channel** to remove the Eth-channel interface channelized from a cellular interface.

Syntax

eth-channel *channel-number*

undo eth-channel *channel-number*

Views

Cellular interface view

Predefined user roles

network-admin

Parameters

channel-number: Specifies an Eth-channel interface by its number. The value range for this argument varies by modem model.

Usage guidelines

This command names the Eth-channel interface channelized from a cellular interface as **eth-channel** *cellular-number:channel-number*.

Examples

Channelize Cellular 2/4/0 into an Eth-channel interface.

```
<Sysname> system-view
[Sysname] controller cellular 2/4/0
[Sysname-Cellular2/4/0] eth-channel 0
```

imsi bind

Use **imsi bind** to bind the IMSI on the SIM card to an interface.

Use **undo imsi bind** to restore the default.

Syntax

```
imsi bind interface-type interface-number
undo imsi bind
```

Default

The IMSI on the SIM card is not bound to any interface.

Views

Cellular interface view

Predefined user roles

network-admin

Parameters

interface-type interface-number: Specifies an interface by its type and number. In the current software version, the IMSI on the SIM card can only be bound to an L2TP virtual PPP interface.

Usage guidelines

This command is not available for distributed devices or devices operating in IRF mode.

A 5G router must support PPP LCP negotiation of the IMSI/SI when it acts as a LAC to access the LNS in LAC-auto-initiated mode. After you bind the IMSI on the SIM card to a virtual PPP interface, the packets sent by the router carry the IMSI.

Examples

```
# Bind the IMSI on the SIM card to Virtual-PPP 1.
<Sysname> system-view
[Sysname] controller Cellular 0/0
[Sysname-Cellular0/0] imsi bind virtual-ppp 1
```

interface eth-channel

Use **interface eth-channel** to enter Eth-channel interface view.

Syntax

```
interface eth-channel interface-number
```

Views

System view

Predefined user roles

network-admin

Parameters

interface-number: Specifies an Eth-channel interface by its number.

Examples

```
# Enter Eth-channel 2/4/0:0 interface view.  
<Sysname> system-view  
[Sysname] interface eth-channel 2/4/0:0  
[Sysname-Eth-channel2/4/0:0]
```

ip address cellular-alloc

Use **ip address cellular-alloc** to enable an Eth-channel interface to obtain an IP address by using the modem-manufacturer's proprietary protocol.

Use **undo ip address cellular-alloc** to restore the default.

Syntax

```
ip address cellular-alloc  
undo ip address cellular-alloc
```

Default

An Eth-channel interface does not obtain an IP address by using the modem-manufacturer's proprietary protocol.

Views

Eth-channel interface view

Predefined user roles

network-admin

Usage guidelines

To enable an interface to obtain an IP address from the modem by using the modem-manufacturer's proprietary protocol, use the **ip address cellular-alloc** command.

To enable an interface to obtain an IP address from the modem by using DHCP, use the **ip address dhcp-alloc** command.

The IP address of the modem is automatically allocated by the service provider.

Examples

```
# Channelize Cellular 2/4/0 into an Eth-channel interface. Enable the Eth-channel interface to obtain  
an IP address by using the modem-manufacturer's proprietary protocol.  
<Sysname> system-view  
[Sysname] controller cellular 2/4/0  
[Sysname-Cellular2/4/0] eth-channel 0  
[Sysname-Cellular2/4/0] quit  
[Sysname] interface eth-channel 2/4/0:0  
[Sysname-Eth-channel2/4/0:0] ip address cellular-alloc
```

ipv6 address cellular-alloc

Use **ipv6 address cellular-alloc** to enable an interface to obtain an IPv6 address by using the modem-manufacturer's proprietary protocol.

Use **undo ipv6 address cellular-alloc** to restore the default.

Syntax

```
ipv6 address cellular-alloc  
undo ipv6 address cellular-alloc
```

Default

An interface does not obtain an IPv6 address by using the modem-manufacturer's proprietary protocol.

Views

Eth-channel interface view

Predefined user roles

network-admin

Usage guidelines

To enable an interface to obtain an IPv6 address by using the modem-manufacturer's proprietary protocol, use the **ipv6 address cellular-alloc** command.

To enable an interface to obtain an IP address by using DHCP, use the **ipv6 address dhcp-alloc** command.

The IPv6 address of the modem is automatically allocated by the service provider.

Examples

Channelize Cellular 2/4/0 into an Eth-channel interface. Enable the Eth-channel interface to obtain an IPv6 address by using the modem-manufacturer's proprietary protocol.

```
<Sysname> system-view  
[Sysname] controller cellular 2/4/0  
[Sysname-Cellular2/4/0] eth-channel 0  
[Sysname-Cellular2/4/0] quit  
[Sysname] interface eth-channel 2/4/0:0  
[Sysname-Eth-channel2/4/0:0] ipv6 address cellular-alloc
```

Related commands

```
ip address cellular-alloc
```

lte band

Use **lte band** to specify a band for a 5G modem.

Use **undo lte band** to restore the default.

Syntax

```
lte band band-number  
undo lte band
```

Default

The default setting for this command varies by modem model.

Views

Cellular interface view

Predefined user roles

network-admin

Parameters

band-number: Specifies a band for a modem. The available bands vary by modem model.

Examples

```
# Specify band 3 for Cellular 2/4/0.
<Sysname> system-view
[Sysname] controller cellular 2/4/0
[Sysname-Controller-Cellular2/4/0] lte band 3
```

mtu

Use **mtu** to set the maximum transmission unit (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

Eth-channel interface view

Predefined user roles

network-admin

Parameters

size: Sets the MTU in bytes. The value range for this argument varies by modem model.

Examples

```
# Set the MTU for Eth-channel 2/4/0:0 to 1430 bytes.
<Sysname> system-view
[Sysname] interface eth-channel 2/4/0:0
[Sysname-Eth-channel2/4/0:0] mtu 1430
```

nr band

Use **nr band** to specify a 5G NR frequency band.

Use **undo nr band** to restore the default.

Syntax

```
nr band nr-band-number
undo nr band
```

Default

The default setting of this command varies by modem model.

Views

Cellular interface view

Predefined user roles

network-admin

Parameters

nr-band-number: Specifies a 5G NR frequency band. The value range varies by modem model.

Examples

```
# Specify NR frequency band 3 for Cellular 2/4/0.  
<Sysname> system-view  
[Sysname] controller cellular 2/4/0  
[Sysname-Controller-Cellular2/4/0] nr band n3
```

Related commands

gsm band

lte band

wcdma band

nr mode

Use **nr mode** to specify the 5G new radio (NR) network deployment mode for 5G modem network registration.

Use **undo nr mode** to restore the default.

Syntax

```
nr mode { nsa | sa | auto }  
undo nr mode
```

Default

A 5G modem registers with a 5G NR network deployed in SA mode preferentially than that deployed in NSA mode.

Views

Cellular interface view

Predefined user roles

network-admin

Parameters

nsa: Specifies the NSA 5G NR network deployment mode for 5G modem network registration.

sa: Specifies the SA 5G NR network deployment mode for 5G modem network registration.

auto: Enables the 5G modem to register with a 5G NR network deployed in SA mode preferentially than that deployed in NSA mode.

Examples

```
# Specify the NSA 5G network deployment mode for 5G modem network registration.  
<Sysname> system-view  
[Sysname] controller cellular 0/0  
[Sysname-Cellular0/0] nr mode nsa
```

pdp-type

Use **pdp-type** to specify the PDP data carrying protocol.

Use **undo pdp-type** to restore the default.

Syntax

```
pdp-type { ipv4 | ipv6 | ipv4v6 }  
undo pdp-type
```

Default

The PDP data carrying protocol is IPv4 and IPv6.

Views

Apn-profile view

Predefined user roles

network-admin

Parameters

ipv4: Specifies the IPv4 protocol.

ipv6: Specifies the IPv6 protocol.

ipv4v6: Specifies the IPv4 and IPv6 protocols.

Examples

```
# Specify the PDP data carrying protocol as IPv4.  
<Sysname> system-view  
[Sysname] apn-profile 1  
[Sysname-apn-profile-1] pdp-type ipv4
```

reset counters interface

Use **reset counters interface** to clear the statistics on the specified or all Eth-channel interfaces.

Syntax

```
reset counters interface [ eth-channel [ channel-id ] ]
```

Views

User view

Predefined user roles

network-admin

Parameters

eth-channel [*channel-id*]: Specifies Eth-channel interfaces or an Eth-channel interface by its number. If you do not the **eth-channel** keyword, the command clears statistics on all interfaces. If you specify the **eth-channel** keyword but not the *channel-id* argument, this command clears statistics on all Eth-channel interfaces. If you specify both the **eth-channel** keyword and the *channel-id* argument, this command clears statistics on the specified Eth-channel interface.

Usage guidelines

Use this command to clear history statistics if you want to collect traffic statistics for a specific period.

Examples

```
# Clear the statistics on Eth-channel 2/4/0:0.  
<Sysname> reset counters interface eth-channel 2/4/0:0
```

shutdown

Use **shutdown** to shut down an Eth-channel interface.

Use **undo shutdown** to bring up an Eth-channel interface.

Syntax

```
shutdown  
undo shutdown
```

Default

The default setting for this command depends on the modem model.

Views

Eth-channel interface view

Predefined user roles

network-admin

Examples

```
# Shut down Eth-channel 2/4/0:0.  
<Sysname> system-view  
[Sysname] interface eth-channel 2/4/0:0  
[Sysname-Eth-channel2/4/0:0] shutdown
```

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DDR commands

MSR1008 routers support only Layer 2 and Layer 3 Ethernet interfaces, and do not support interface modules. Therefore, MSR1008 routers do not support traditional DDR.

bandwidth

Use **bandwidth** to set the expected bandwidth for a dialer 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

Dialer 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 Dialer 1 to 100 kbps.

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

```
[Sysname] interface dialer 1
```

```
[Sysname-Dialer1] bandwidth 100
```

default

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

Syntax

default

Views

Dialer 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 impact of this command when you execute it on a live network.

This command might fail to restore the default settings for some commands for reasons such as command dependencies or 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 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 Dialer 1.
<Sysname> system-view
[Sysname] interface dialer 1
[Sysname-Dialer1] default
```

description

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

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

Syntax

```
description text
undo description
```

Default

The description of a dialer interface is *interface-name* **Interface**, for example, **Dialer1 Interface**.

Views

Dialer interface view

Predefined user roles

network-admin

Parameters

text: Specifies the interface description, a case-sensitive string of 1 to 255 characters.

Examples

```
# Set the description of Dialer 1 to dialer-intf.
<Sysname> system-view
[Sysname] interface dialer 1
[Sysname-Dialer1] description dialer-intf
```

dialer bundle enable

Use **dialer bundle enable** to enable bundle DDR on a dialer interface.

Use **undo dialer bundle enable** to disable bundle DDR on a dialer interface.

Syntax

```
dialer bundle enable  
undo dialer bundle enable
```

Default

Bundle DDR is disabled on a dialer interface.

Views

Dialer interface view

Predefined user roles

network-admin

Usage guidelines

DDR includes traditional DDR and bundle DDR.

After you use this command on a dialer interface already enabled with traditional DDR, the system clears the original traditional DDR settings.

The **undo dialer bundle enable** command clears all bundle DDR settings on the dialer interface.

Examples

```
# Enable bundle DDR on Dialer 1.  
<Sysname> system-view  
[Sysname] interface dialer 1  
[Sysname-Dialer1] dialer bundle enable
```

Related commands

```
dialer circular enable  
dialer peer-name
```

dialer bundle-member

Use **dialer bundle-member** to assign a physical interface to a dialer bundle in bundle DDR.

Use **undo dialer bundle-member** to remove a physical interface from a dialer bundle in bundle DDR.

Syntax

```
dialer bundle-member number [ priority priority ]  
undo dialer bundle-member number
```

Default

A physical interface does not belong to any dialer bundle in bundle DDR.

Views

Physical interface view

Predefined user roles

network-admin

Parameters

number: Specifies a dialer bundle by its number, which must be the same as the dialer interface number.

priority *priority*: Specifies the priority of the physical interface in the dialer bundle, in the range of 1 to 255. The default priority is 1. The greater the number, the higher the priority. Each time a call is placed, the highest-priority physical interface available is selected. If multiple physical interfaces with the highest priority are available, these interfaces are selected in a round-robin manner.

Usage guidelines

A physical interface can belong to multiple dialer bundles. You can execute this command multiple times to assign a physical interface to different dialer bundles.

When the specified dialer interface does not exist, this command creates one and enables bundle DDR on it.

Examples

```
# Assign BRI 2/4/0 to Dialer bundle 1 and Dialer bundle 2, with a priority of 50 in both dialer bundles.
<Sysname> system-view
[Sysname] interface bri 2/4/0
[Sysname-Bri2/4/0] dialer bundle-member 1 priority 50
[Sysname-Bri2/4/0] dialer bundle-member 2 priority 50
```

Related commands

dialer bundle enable
interface dialer

dialer callback-center

Use **dialer callback-center** to configure the PPP callback reference.

Use **undo dialer callback-center** to restore the default.

Syntax

dialer callback-center [**dial-number** | **user**] *
undo dialer callback-center

Default

No PPP callback reference is configured.

Views

Dialup interface view

Predefined user roles

network-admin

Parameters

dial-number: Uses the callback number configured in the **authorization-attribute callback-number** command in local user view to place return calls.

user: Uses the dial string configured in the **dialer route** command to place return calls.

Usage guidelines

This command is mandatory on the PPP callback server.

If both the **dial-number** and **user** keywords are specified, the device attempts to place return calls by using the dial string determined by the first keyword entered. If the attempt fails, the device places return calls by using the dial string determined by the second keyword entered.

If the command is configured with neither keyword, it has the same effect as the **dialer callback-center user dial-number** command.

Examples

Specify the device as the PPP callback server on Serial 2/1/0, and set the callback reference to user mode.

```
<Sysname> system-view
[Sysname] interface serial 2/1/0
[Sysname-Serial2/1/0] ppp callback server
[Sysname-Serial2/1/0] dialer callback-center user
[Sysname-Serial2/1/0] dialer route ip 1.1.1.2 dial-number 8810052 user Sysnameb
```

Specify the device as the PPP callback server on Serial 2/1/0, and set the callback reference to dial number mode.

```
<Sysname> system-view
[Sysname] local-user usera
[Sysname-luser-usera] password simple 123456TESTplat&!
[Sysname-luser-usera] service-type ppp
[Sysname-luser-usera] authorization-attribute callback-number 8810048
[Sysname-luser-usera] quit
[Sysname] interface serial 2/1/0
[Sysname-Serial2/1/0] ppp callback server
[Sysname-Serial2/1/0] dialer callback-center dial-number
```

Specify the device as the PPP callback server on Dialer 1, and set the callback reference to user mode.

```
<Sysname> system-view
[Sysname] interface dialer 1
[Sysname-Dialer1] ppp callback server
[Sysname-Dialer1] dialer callback-center user
[Sysname-Dialer1] dialer route ip 1.1.1.2 dial-number 8810052 user Sysnameb
```

Specify the device as the PPP callback server on Dialer 1, and set the callback reference to dial number mode.

```
<Sysname> system-view
[Sysname] local-user usera
[Sysname-luser-usera] password simple 123456TESTplat&!
[Sysname-luser-usera] service-type ppp
[Sysname-luser-usera] authorization-attribute callback-number 8810048
[Sysname-luser-usera] quit
[Sysname] interface dialer 1
[Sysname-Dialer1] ppp callback server
[Sysname-Dialer1] dialer callback-center dial-number
```

Related commands

ppp callback

dialer circular enable

Use **dialer circular enable** to enable traditional DDR on a dialup interface.

Use **undo circular bundle enable** to disable traditional DDR on a dialup interface.

Syntax

dialer circular enable

undo dialer circular enable

The following compatibility matrixes show support of hardware platforms for this command:

Models	Compatibility
MSR1008	No
MSR2630E-X1	Yes
MSR3610E-X1, MSR3610E-X1-DP	Yes

Models	Compatibility
MSR2660-XS	No
MSR2680-XS	Yes

Models	Compatibility
MSR2600-12X-WiNet	No
MSR2610-13X-WiNet	Yes

Default

Traditional DDR is disabled on a dialup interface.

Views

Dialup interface view

Predefined user roles

network-admin

Usage guidelines

DDR includes traditional DDR and bundle DDR.

Before using traditional DDR, you must use this command to enable traditional DDR on the dialup interface.

If you use this command on a dialup interface already enabled with bundle DDR, the system clears the original bundle DDR settings.

The **undo dialer circular enable** command clears all DDR settings on the dialup interface.

Examples

```
# Enable traditional DDR on Serial 2/1/0.
<Sysname> system-view
[Sysname] interface serial 2/1/0
[Sysname-Serial2/1/0] dialer circular enable

# Enable traditional DDR on Dialer 1.
<Sysname> system-view
[Sysname] interface dialer 1
[Sysname-Dialer1] dialer circular enable
```

Related commands

dialer bundle enable

dialer circular-group

dialer circular-group

Use **dialer circular-group** to assign a physical interface to a dialer circular group in traditional DDR.

Use **undo dialer circular-group** to restore the default.

Syntax

dialer circular-group *number*

undo dialer circular-group

Default

A physical interface does not belong to any dialer circular group in traditional DDR.

Views

Physical interface view

Predefined user roles

network-admin

Parameters

number: Specifies a dialer circular group by its number, which must be the same as the one defined in the **interface dialer** command.

Usage guidelines

In traditional DDR, you can assign a physical interface to a dialer interface by assigning it to the dialer circular group associated with the dialer interface. A physical interface can belong to only one dialer circular group, but a dialer circular group can contain multiple physical interfaces. When placing a call on a dialer circular group, DDR selects the physical interface with the highest priority.

When the dialer interface does not exist, this command creates one and enables traditional DDR on it.

Examples

Assign Serial 2/1/0 and Serial 2/1/1 to dialer circular group 1.

```
<Sysname> system-view
[Sysname] interface dialer 1
[Sysname-Dialer1] quit
[Sysname] interface serial 2/1/0
[Sysname-Serial2/1/0] dialer circular-group 1
[Sysname-Serial2/1/0] quit
[Sysname] interface serial 2/1/1
[Sysname-Serial2/1/1] dialer circular-group 1
```

Related commands

dialer circular enable

dialer priority

interface dialer

dialer disconnect

Use **dialer disconnect** to disconnect dialup links on an interface.

Syntax

dialer disconnect [**interface** *interface-type interface-number*]

Views

Any view

Predefined user roles

network-admin

Parameters

interface *interface-type interface-number*: Specifies an interface by its type and number. If you do not specify an interface, this command disconnects dialup links on all interfaces.

Examples

```
# Disconnect dialup links on Dialer 0.
<Sysname> dialer disconnect interface dialer0
```

dialer number

Use **dialer number** to configure a dial string for placing calls to a single remote site.

Use **undo dialer number** to restore the default.

Syntax

dialer number *number* [**autodial**]
undo dialer number

Default

No dial string is configured for calling the remote site.

Views

Dialup interface view

Predefined user roles

network-admin

Parameters

number: Specifies a dial string for calling a remote site, a case-insensitive string of 1 to 30 characters.

autodial: Enables the interface to automatically dial the remote site by using the specified dial string at specified intervals. The interval is set in the **dialer timer autodial** command and defaults to 300 seconds.

Usage guidelines

You must use this command when the dialer or physical interface is the calling party.

In traditional DDR, you can also use the **dialer route** command to configure multiple destination addresses or dial strings for a dialer interface.

In bundle DDR, you can only use the **dialer number** command to configure one dial string for each dialer interface. This is because associations between dialer interfaces and call destination address are one-to-one.

Examples

```
# Set the dial string for placing calls to 11111 on Serial 2/1/0.
<Sysname> system-view
```

```
[Sysname] interface serial 2/1/0
[Sysname-Serial2/1/0] dialer number 11111
# Set the dial string for placing calls to 11111 on Dialer 1.
<Sysname> system-view
[Sysname] interface dialer 1
[Sysname-Dialer1] dialer number 11111
```

Related commands

dialer route
dialer timer autodial

dialer peer-name

Use **dialer peer-name** to specify the host name of the remote device for authenticating incoming calls.

Use **undo dialer peer-name** to remove the specified host name.

Syntax

```
dialer peer-name username
undo dialer peer-name [ username ]
```

Default

No host name of the remote device is specified for authenticating incoming calls.

Views

Dialer interface view

Predefined user roles

network-admin

Parameters

username: Specifies the host name of the remote device, a case-insensitive string of 1 to 80 characters.

Usage guidelines

The local device matches the peer names obtained in PPP authentication with the host names configured by this command to determine which dialer interface receives which call.

This command takes effect only on bundle DDR dialer interfaces. You can configure a maximum number of 255 host names for a dialer interface. This enables one dialer interface to receive calls from multiple physical interfaces.

If a bundle DDR dialer interface is not configured with any host name, this interface can place calls but cannot receive calls.

Examples

```
# Specify the host name of the remote device for Dialer 1 to routerb.
<Sysname> system-view
[Sysname] interface dialer 1
[Sysname-Dialer1] dialer peer-name routerb
```

dialer priority

Use **dialer priority** to assign a priority to a physical interface in a dialer circular group.

Use **undo dialer priority** to restore the default.

Syntax

dialer priority *priority*

undo dialer priority

Default

The priority of a physical interface in a dialer circular group is 1.

Views

Physical interface view

Predefined user roles

network-admin

Parameters

priority: Specifies the priority of the physical interface in a dialer circular group, in the range of 1 to 127. The larger the value, the higher the priority.

Usage guidelines

This command sets the order in which the available physical interfaces in a dialer circular group are used. Each time a call is placed, the highest-priority physical interface available is selected. If multiple physical interfaces with the highest priority are available, these interfaces are selected in a round-robin manner.

Examples

```
# Set the priority of Serial 2/1/0 in dialer circular group 1 to 5.
<Sysname> system-view
[Sysname] interface serial 2/1/0
[Sysname-Serial2/1/0] dialer circular-group 1
[Sysname-Serial2/1/0] dialer priority 5
```

Related commands

dialer circular-group

dialer queue-length

Use **dialer queue-length** to set the number of packets that can be buffered on a dialup interface.

Use **undo dialer queue-length** to restore the default.

Syntax

dialer queue-length *packets*

undo dialer queue-length

Default

No packets are buffered on a dialup interface.

Views

Dialup interface view

Predefined user roles

network-admin

Parameters

packets: Specifies the number of packets that can be buffered on the interface, in the range of 1 to 100.

Usage guidelines

If no connection is available when a dialup interface without a buffer queue receives a packet, the interface drops the packet. Configured with a buffer queue, the dialup interface buffers the packet until a connection is available for packet sending.

Examples

```
# Set the number of packets that can be buffered to 10 on Serial 2/1/0.
<Sysname> system-view
[Sysname] interface serial 2/1/0
[Sysname-Serial2/1/0] dialer queue-length 10

# Set the number of packets that can be buffered to 10 on Dialer 1.
<Sysname> system-view
[Sysname] interface dialer 1
[Sysname-Dialer1] dialer queue-length 10
```

dialer route

Use **dialer route** to configure a dialup interface to place calls to a remote site or receive calls from it.

Use **undo dialer route** to remove the configuration.

Syntax

```
dialer route ip next-hop-address [ mask network-mask-length ]
[ vpn-instance vpn-instance-name ] [ dial-number dial-number [ autodial |
interface interface-type interface-number ] * ] [ broadcast | user hostname ]
*
```

```
undo dialer route protocol next-hop-address [ mask network-mask-length ]
[ vpn-instance vpn-instance-name ] [ dial-number dial-number ]
```

Default

No dial string is configured.

Views

Dialup interface view

Predefined user roles

network-admin

Parameters

ip: Specifies IP as the network layer protocol.

next-hop-address: Specifies the IP address of the remote site.

mask network-mask-length: Specifies a mask length for the remote IP address, in the range of 0 to 32. If no mask length is specified, a 32-bit mask applies. Setting the *next-hop-address* argument to 0.0.0.0 and the *network-mask-length* argument to 0 indicates any remote IP address.

vpn-instance *vpn-instance-name*: Specifies an MPLS L3VPN instance by its name, a case-sensitive string of 1 to 31 characters.

dial-number *dial-number*: Specifies the dial string for calling the remote site, a case-insensitive string of 1 to 30 characters. If no dial string is specified, the interface can only receive calls.

autodial: Enables the interface to automatically dial the specified dial string at specified intervals. The interval is set in the **dialer timer autodial** command and defaults to 300 seconds.

interface *interface-type interface-number*: Specifies a physical interface by its type and number. When multiple physical interfaces are assigned to a dialer interface and their dialup links are connected to different SPCSs, you must associate each dial string with one physical interface. This configuration is intended for dialer interfaces in traditional DDR only.

broadcast: Enables broadcast packets to pass through the dialup link.

user *hostname*: Specifies a host name of the remote device, a case-insensitive string of 1 to 80 characters used to authenticate incoming calls.

Usage guidelines

To enable DDR to originate calls, you must configure the **dial-number** *number* option. Otherwise, DDR can only receive calls.

If you specify the *number* argument in the **dialer route** command, you must also include the *number* argument when using the **undo dialer route** command to remove the dial string.

To use the **user** keyword, you must configure PPP authentication. DDR accepts a call only when the host name obtained through PPP authentication is the same as the remote username configured by using this command.

You can configure a dialup interface to place calls to or receive calls from multiple remote sites. You can also configure multiple dial strings for one destination address for backup purposes.

Examples

On Serial 2/1/0, specify a dial string of **888066** for packets destined to network 192.168.1.0/24.

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

```
[Sysname] interface serial 2/1/0
```

```
[Sysname-Serial2/1/0] dialer route ip 192.168.1.0 mask 24 dial-number 888066
```

On Serial 2/1/0, specify a dial string of **888065** for packets destined to host address 191.168.1.1.

```
[Sysname-Serial2/1/0] dialer route ip 191.168.1.1 dial-number 888065
```

On Dialer 1, specify a dial string of **888066** for packets destined to network 192.168.1.0/24.

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

```
[Sysname] interface dialer 1
```

```
[Sysname-Dialer1] dialer route ip 192.168.1.0 mask 24 dial-number 888066
```

On Dialer 1, specify a dial string of **888065** for packets destined to host address 191.168.1.1.

```
[Sysname-Dialer1] dialer route ip 191.168.1.1 dial-number 888065
```

Related commands

dialer timer autodial

dialer timer autodial

Use **dialer timer autodial** to set the auto-dial timer.

Use **undo dialer timer autodial** to restore the default.

Syntax

```
dialer timer autodial autodial-interval  
undo dialer timer autodial
```

Default

The auto-dial timer is 300 seconds.

Views

Dialup interface view

Predefined user roles

network-admin

Parameters

autodial-interval: Specifies the interval between auto-dial attempts, in the range of 1 to 604800 seconds.

Usage guidelines

This command takes effect only when the **autodial** keyword is specified in the **dialer number** or **dialer route** command. DDR automatically dials the dial string at the specified interval until a connection is established. In the auto-dial method, dial attempts are not traffic triggered. Once a connection is established, it will not disconnect based on the idle timer mechanism.

Examples

```
# Set the auto-dial timer to 60 seconds on Serial 2/1/0.  
<Sysname> system-view  
[Sysname] interface serial 2/1/0  
[Sysname-Serial2/1/0] dialer timer autodial 60  
  
# Set the auto-dial timer to 60 seconds on Dialer 1.  
<Sysname> system-view  
[Sysname] interface dialer 1  
[Sysname-Dialer1] dialer timer autodial 60
```

Related commands

```
dialer number  
dialer route
```

dialer timer compete

Use **dialer timer compete** to set the compete-idle timer.

Use **undo dialer timer compete** to restore the default.

Syntax

```
dialer timer compete compete-idle  
undo dialer timer compete
```

Default

The compete-idle timer is 20 seconds.

Views

Dialup interface view

Predefined user roles

network-admin

Parameters

compete-idle: Specifies the idle time when contention occurs, in the range of 0 to 65535 seconds.

Usage guidelines

The idle-timeout timer starts when a link is established. If all physical interfaces are in use when DDR places a new call, contention occurs. DDR starts the compete-idle timer to replace the idle-timeout timer. When the compete-idle timer expires, DDR disconnects the idle links.

Examples

```
# Set the compete-idle timer to 10 seconds on Serial 2/1/0.
<Sysname> system-view
[Sysname] interface serial 2/1/0
[Sysname-Serial2/1/0] dialer timer compete 10

# Set the compete-idle timer to 10 seconds on Dialer 1.
<Sysname> system-view
[Sysname] interface dialer 1
[Sysname-Dialer1] dialer timer compete 10
```

dialer timer enable

Use **dialer timer enable** to set the link holddown timer.

Use **undo dialer timer enable** to restore the default.

Syntax

```
dialer timer enable interval
undo dialer timer enable
```

Default

The link holddown timer is 5 seconds.

Views

Dialup interface view

Predefined user roles

network-admin

Parameters

interval: Specifies the holddown timer value in the range of 5 to 65535 seconds.

Usage guidelines

The holddown timer starts when a link is disconnected. A call attempt to bring up this link can be made only after the timer expires. This is to prevent a remote SPCS from being overloaded.

To leave enough time for callback, set the holddown timer on the client 10 or more seconds longer than that on the server. As a best practice, set the link holddown timer to 5 seconds (the default) on the server, and 15 seconds on the client.

Examples

```
# Set the link holddown timer to 15 seconds for Serial 2/1/0.
<Sysname> system-view
```

```

[Sysname] interface serial 2/1/0
[Sysname-Serial2/1/0] dialer timer enable 15
# Set the link holddown timer to 15 seconds for Dialer 1.
<Sysname> system-view
[Sysname] interface dialer 1
[Sysname-Dialer1] dialer timer enable 15

```

dialer timer idle

Use **dialer timer idle** to set the link idle-timeout timer.

Use **undo dialer timer idle** to restore the default.

Syntax

```

dialer timer idle idle [in | in-out ]
undo dialer timer idle

```

Default

The link idle-timeout timer is 120 seconds, and only outgoing interesting packets reset this timer.

Views

Dialup interface view

Predefined user roles

network-admin

Parameters

idle: Specifies the link idle-timeout timer value in the range of 0 to 65535 seconds.

in: Allows only incoming interesting packets to reset the timer.

in-out: Allows both incoming and outgoing interesting packets to reset the timer.

Usage guidelines

The link idle-timeout timer starts when a link is established. If no interesting packets arrive before the timer expires, DDR disconnects the link.

If you do not specify the **in** or **in-out** keyword, only outgoing interesting packets reset the timer.

If the timer is set to 0, DDR will never disconnect the link. For a PPPoE client application, if the timer is set to 0, a dialup connection is created automatically and remains active permanently.

Examples

```

# Set the link idle-timeout timer to 50 seconds on Serial 2/1/0.
<Sysname> system-view
[Sysname] interface serial 2/1/0
[Sysname-Serial2/1/0] dialer timer idle 50
# Set the link idle-timeout timer to 50 seconds on Dialer 1.
<Sysname> system-view
[Sysname] interface dialer 1
[Sysname-Dialer1] dialer timer idle 50

```

dialer timer wait-carrier

Use **dialer timer wait-carrier** to set the wait-carrier timer.

Use **undo dialer timer wait-carrier** to restore the default.

Syntax

```
dialer timer wait-carrier wait-carrier  
undo dialer timer wait-carrier
```

Default

The wait-carrier timer is 60 seconds.

Views

Dialup interface view

Predefined user roles

network-admin

Parameters

wait-carrier: Specifies the wait-carrier timer value in the range of 0 to 65535 seconds.

Usage guidelines

The wait-carrier timer limits the amount of time that DDR waits for a connection to be established for a call. The wait-carrier timer starts when a call is placed. If the connection is not established before the timer expires, DDR terminates the call.

Examples

```
# Set the wait-carrier timer to 100 seconds on Serial 2/1/0.  
<Sysname> system-view  
[Sysname] interface serial 2/1/0  
[Sysname-Serial2/1/0] dialer timer wait-carrier 100  
  
# Set the wait-carrier timer to 100 seconds on Dialer 1.  
<Sysname> system-view  
[Sysname] interface dialer 1  
[Sysname-Dialer1] dialer timer wait-carrier 100
```

dialer timer warmup

Use **dialer timer warmup** to set the warm-up timer for dynamic route backup.

Use **undo dialer timer warmup** to restore the default.

Syntax

```
dialer timer warmup delay  
undo dialer timer warmup
```

Default

The warm-up timer for dynamic route backup is 30 seconds.

Views

System view

Predefined user roles

network-admin

Parameters

delay: Specifies the warm-up timer value for dynamic route backup, in the range of 0 to 65535 seconds.

Usage guidelines

The warm-up timer introduces a delay for the dynamic route backup feature to operate after a system startup. Set this delay to prevent unnecessary link switchover at startup.

Interfaces cannot come up until the device recovers the configuration during a reboot.

Without a warm-up delay, the dynamic route backup feature dials the secondary link immediately after it detects that the primary interface is down. When the primary interface comes up, the feature dials the primary link. The secondary link, if dialed up successfully, is brought down shortly after it came up.

With a warm-up delay, the dynamic route backup feature does not dial the secondary link until it detects that the primary interface is down when the delay expires.

Examples

```
# Set the warm-up timer to 20 seconds for dynamic route backup.
<Sysname> system-view
[Sysname] dialer timer warmup 20
```

dialer-group

Use **dialer-group** to assign a dialup interface to a dialer group.

Use **undo dialer-group** to restore the default.

Syntax

dialer-group *group-number*

undo dialer-group

Default

A dialup interface does not belong to any dialer group.

Views

Dialup interface view

Predefined user roles

network-admin

Parameters

group-number: Specifies a dialer group by its number in the range of 1 to 255. Before the assignment, you must create the dialer group by using the **dialer-group rule** command.

Usage guidelines

A dialup interface can belong to only one dialer group. If you use this command multiple times, the most recent configuration takes effect.

You must use this command for DDR to send packets.

Examples

```
# Assign Serial 2/1/0 to dialer group 1.
```

```

<Sysname> system-view
[Sysname] dialer-group 1 rule acl 3101
[Sysname] interface serial 2/1/0
[Sysname-Serial2/1/0] dialer-group 1
# Assign Dialer 1 to dialer group 1.
<Sysname> system-view
[Sysname] dialer-group 1 rule acl 3101
[Sysname] interface dialer 1
[Sysname-Dialer1] dialer-group 1

```

Related commands

dialer-group rule

dialer-group rule

Use **dialer-group rule** to create a dialer group and configure a dial rule for it.

Use **undo dialer-group rule** to delete a dialer group.

Syntax

```

dialer-group group-number rule { ip | ipv6 } { deny | permit | acl
{ acl-number | name acl-name } }
undo dialer-group group-number rule [ ip | ipv6 ]

```

Default

No dialer group exists.

Views

System view

Predefined user roles

network-admin

Parameters

group-number: Specifies the number of the dialer group to be created, in the range of 1 to 255.

ip: Specifies the IPv4 protocol.

ipv6: Specifies the IPv6 protocol.

deny: Denies packets of the specified protocol.

permit: Permits packets of the specified protocol.

acl *acl-number*: Specifies an ACL by its number in the range of 2000 to 3999.

name *acl-name*: Specifies an ACL by its name.

Usage guidelines

A dial rule determines when an interface initiates DDR calls. You need to configure dial rules only on the initiator of DDR calls.

You can configure a dial rule to match only IP packets or use an ACL to match packets.

Permitted protocol packets or packets that match a permit statement of an ACL are interesting packets. When receiving an interesting packet, DDR performs one of the following operations:

- Sends it out and resets the idle-timeout timer if a link is present.

- Originates a new call to establish a link if no link is present.

Denied protocol packets or packets that match a deny statement of an ACL are uninteresting packets. When receiving an uninteresting packet, DDR performs one of the following operations:

- Sends it out without resetting the idle-timeout timer if a link is present.
- Drops it if no link is present.

For DDR to forward packets correctly, you must configure a dial rule and associate it with the dialup interface by using the **dialer-group** command.

When specifying an ACL, follow these restrictions and guidelines:

- If the specified ACL does not exist or does not have any rules, the dial rule does not take effect. The device does not initiate DDR calls, and drops the matching protocol packets.
- In the specified ACL, if a rule has the **vpn-instance** keyword specified, the rule takes effect only on VPN packets. If a rule does not have the **vpn-instance** keyword specified, the rule takes effect only on packets in the public network.

Examples

Create dialer group 1 and configure DDR to place calls for IPv4 packets. Associate Serial 2/1/0 with dialer group 1.

```
<Sysname> system-view
[Sysname] dialer-group 1 rule ip permit
[Sysname] interface serial 2/1/0
[Sysname-Serial2/1/0] dialer-group 1
```

Create dialer group 1 and configure DDR to place calls for IPv6 packets. Associate Serial 2/1/0 with dialer group 1.

```
<Sysname> system-view
[Sysname] dialer-group 1 rule ipv6 permit
[Sysname] interface serial 2/1/0
[Sysname-Serial2/1/0] dialer-group 1
```

Create dialer group 1 and configure DDR to place calls for IPv4 packets. Associate Dialer 1 with dialer group 1.

```
<Sysname> system-view
[Sysname] dialer-group 1 rule ip permit
[Sysname] interface dialer 1
[Sysname-Dialer1] dialer-group 1
```

Create dialer group 1 and configure DDR to place calls for IPv6 packets. Associate Dialer 1 with dialer group 1.

```
<Sysname> system-view
[Sysname] dialer-group 1 rule ipv6 permit
[Sysname] interface dialer 1
[Sysname-Dialer1] dialer-group 1
```

Related commands

dialer-group

display dialer

Use **display dialer** to display the DDR information for an interface.

Syntax

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

Views

Any view

Predefined user roles

network-admin
network-operator

Parameters

interface *interface-type interface-number*: Specifies an interface by its type and number. If you do not specify an interface, this command displays the DDR information for all interfaces.

Examples

Display the DDR information for all interfaces.

```
<Sysname> display dialer
```

```
Dialer0:
```

```
Dialer Route:
```

```
NextHop: 111.111.111.111 Dialer number: 12345678901234567890
```

```
NextHop: 222.222.222.222 Dialer number: 12345678901234567890
```

```
Dialer number:
```

```
Dialer Timers(in seconds):
```

```
Auto-dial: 300 Compete: 20 Enable: 5
```

```
Idle: 120 Wait-for-Carrier: 60
```

```
Total Channels: 1
```

```
Free Channels: 1
```

Table 1 Command output

Field	Description
Dialer0	Dialup interface: dialer or physical.
Dialer Route: NextHop: 111.111.111.111 Dialer number: 12345678901234567890	Remote IP address and dial string set by using the dialer route command.
Dialer number	Dial string for a remote IP address.
Dialer Timers(in seconds): Auto-dial: 300 Compete: 20 Enable: 5 Idle: 120 Wait-for-Carrier: 60	DDR timers in seconds: • Auto-dial—Auto-dial timer set by the dialer timer autodial command. • Compete—Compete-idle timer set by the dialer timer compete command. • Enable—Link holddown timer set by the dialer timer enable command. • Idle—Link idle-timeout timer set by the dialer timer idle command. • Wait-for-Carrier—Wait-carrier timer set by the dialer timer wait-carrier command.
Total Channels	Total number of physical interfaces on the interface.
Free Channels	Number of free channels.

display interface dialer

Use **display interface dialer** to display information about a dialer interface.

Syntax

```
display interface [ dialer [ interface-number ] ] [ brief [ description | down ] ]
```

Views

Any view

Predefined user roles

network-admin
network-operator

Parameters

dialer [*interface-number*]: Specifies a dialer interface by its number. If you do not specify the **dialer** keyword, this command displays information about all interfaces on the device. If you specify the **dialer** keyword, this command displays information about all dialer interfaces.

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 25 characters of each interface description.

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.

Examples

```
# Display detailed information about Dialer 1.
<Sysname> display interface dialer 1
Dialer1
Current state: UP
Line protocol state: UP (spoofing)
Description: Dialer1 Interface
Bandwidth: 64kbps
Maximum Transmit Unit: 1500
Hold timer: 10 seconds, retry times: 5
Internet protocol processing: disabled
Link layer protocol: PPP
LCP: initial
Physical: Dialer, 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
Last clearing of counters: Never
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 dropped
Output: 0 packets, 0 bytes, 0 dropped

# Display brief information about Dialer 1.
<Sysname> display interface dialer 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
Dial1	UP	UP(s)	--	

Display brief information about all dialer interfaces in physically Down state.

<Sysname> display interface dialer brief down

Brief information on interface(s) under route mode:

Link: ADM - administratively down; Stby - standby

Interface	Link	Cause
Dial1	ADM	Administratively

Table 2 Command output

Field	Description
Dialer1 Current state	Physical state of the dialer interface: • Administratively DOWN—The interface has been shut down by using the shutdown command. • UP—The interface is both administratively and physically up.
Line protocol state	Data link layer state of the interface. The state is determined through automatic parameter negotiation at the data link layer. • UP—The data link layer protocol is up. • DOWN—The data link layer protocol is down.
Description	Description of the interface.
Bandwidth	Expected bandwidth of the interface.
Maximum Transmit Unit	MTU of the interface.
Hold timer	Interval for sending keepalive packets.
retry times	Maximum number of keepalive retransmission attempts. A link is removed after the maximum number of retransmission attempts is reached.

Field	Description
Internet address: <i>ip-address/mask-length (Type)</i>	IP address of the interface and type of the address in parentheses. Possible IP address types include: • Primary—Manually configured primary IP address. • Sub—Manually configured secondary IP address. If the interface has both primary and secondary IP addresses, the primary IP address is displayed. If the interface has only secondary IP addresses, the lowest secondary IP address is displayed. • DHCP-allocated—DHCP allocated IP address. For more information, see DHCP client configuration in <i>Layer 3—IP Services Configuration Guide</i>. • BOOTP-allocated—BOOTP allocated IP address. For more information, see BOOTP client configuration in <i>Layer 3—IP Services Configuration Guide</i>. • PPP-negotiated—IP address assigned by a PPP server during PPP negotiation. For more information, see PPP configuration in <i>Layer 2—WAN Access Configuration Guide</i>. • Unnumbered—IP address borrowed from another interface. • Cellular-allocated—IP address allocated through the modem-manufacturer's proprietary protocol. For more information, see mobile communication modem management in <i>Layer 2—WAN Access Configuration Guide</i>. • MTunnel—IP address of the multicast tunnel interface (MTI), which is the same as the IP address of the MVPN source interface. For more information, see multicast VPN configuration in <i>IP Multicast Configuration Guide</i>.
Internet protocol processing: Disabled	The interface is not assigned an IP address and cannot process IP packets.
Internet Address	IP address of the interface. The primary attribute indicates that the address is the primary IP address.
LCP: initial	LCP initialization is complete.
Physical	Physical interface type.
Output queue - Urgent queuing: Size/Length/Discards	Statistics on the packets in the urgent output queue.
Output queue - Protocol queuing: Size/Length/Discards	Statistics on the packets in the protocol output queue.
Output queue - FIFO queuing: Size/Length/Discards	Statistics on the packets in the FIFO output queue.
Last clearing of counters: Never	Time when the reset counters interface command was last used to clear the interface statistics. This field displays Never if the reset counters interface command has never been used on the interface since device startup.
Last 300 seconds input rate	Input interface data rate during the latest 300 seconds.
Last 300 seconds output rate	Output interface data rate during the latest 300 seconds.
Input: 0 packets, 0 bytes, 0 dropped	Statistics on the packets reaching the interface.
Output: 0 packets, 0 bytes, 0 dropped	Statistics on the packets sent through the interface.
Brief information on interface(s) under route mode:	Brief information about Layer 3 interfaces.
Interface	Abbreviated interface name.

Field	Description
Link	Physical link state of the interface: • UP—The interface is physically up. • DOWN—The interface is physically down. • ADM—The interface has been shut down by using the shutdown command. To restore the physical state of the interface, use the undo shutdown command. • Stby—The interface is a backup interface in standby state. To see the primary interface, use the display interface-backup state command.
Protocol	Data link layer protocol state of the interface: • UP—The data link layer protocol of the interface is up. • DOWN—The data link layer protocol of the interface is down. • UP(s)—The data link layer protocol of the interface is up, but the link is an on-demand link or does not exist. The (s) attribute represents the spoofing flag. This value is typical of null interfaces and loopback interfaces.
Main IP	Primary IP address of the interface. This field displays two hyphens (--) if the interface does not have an IP address.
Cause	Cause for the physical link state of an interface to be DOWN : • Administratively—The interface has been manually shut down by using the shutdown command. To restore the physical state of the interface, use the undo shutdown command. • Not connected—No physical connection exists (possibly because the network cable is disconnected or faulty).

Related commands

reset counters interface

interface dialer

Use **interface dialer** to create a dialer interface and enter its view, or enter the view of an existing dialer interface.

Use **undo interface dialer** to delete a dialer interface.

Syntax

interface dialer *number*

undo interface dialer *number*

Default

No dialer interface exists.

Views

System view

Predefined user roles

network-admin

Parameters

number: Specifies the number of the dialer interface, in the range of 0 to 1023.

Usage guidelines

A dialer interface has a fixed baud rate of 64000 bps.

Examples

```
# Create Dialer 1.
<Sysname> system-view
[Sysname] interface dialer 1
```

mtu

Use **mtu** to set the maximum transmission unit (MTU) of a dialer interface.

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

Syntax

```
mtu size
undo mtu
```

Default

The MTU of dialer interfaces is 1500 bytes.

Views

Dialer interface view

Predefined user roles

network-admin

Parameters

size: Specifies the MTU in the range of 128 to 1500 bytes.

Usage guidelines

The MTU setting of a dialer interface affects the fragmentation and reassembly of IP packets.

Examples

```
# Set the MTU of Dialer 1 to 1200 bytes.
<Sysname> system-view
[Sysname] interface dialer 1
[Sysname-Dialer1] mtu 1200
```

ppp callback

Use **ppp callback** to enable an interface to initiate or accept callback requests as the callback client or server.

Use **undo ppp callback** to disable an interface from initiating or accepting callback requests.

Syntax

```
ppp callback { client | server }
undo ppp callback { client | server }
```

Default

Callback requests are not initiated or accepted.

Views

Dialup interface view

Predefined user roles

network-admin

Parameters

client: Enables the interface to initiate callback requests as the callback client.

server: Enables the interface to accept callback requests as the callback server.

Usage guidelines

The callback client first originates a call, and the server decides whether to place a return call. If a return call is needed, the callback server disconnects the call and originates a return call according to the username or callback number.

PPP callback saves costs when the call rates in two directions are different.

Examples

```
# Enable Serial 2/1/0 to accept callback requests as the callback server.
```

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

```
[Sysname] interface serial 2/1/0
```

```
[Sysname-Serial2/1/0] ppp callback server
```

```
# Enable Dialer 1 to accept callback requests as the callback server.
```

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

```
[Sysname] interface dialer 1
```

```
[Sysname-Dialer1] ppp callback server
```

ppp callback ntstring

Use **ppp callback ntstring** to specify a dial string for a Windows server to call back.

Use **undo ppp callback ntstring** to restore the default.

Syntax

ppp callback ntstring *dial-number*

undo ppp callback ntstring

Default

No callback dial string is specified.

Views

Dialup interface view

Predefined user roles

network-admin

Parameters

dial-number: Specifies the dial string, a case-sensitive string of 1 to 64 characters.

Usage guidelines

Use this command on the callback client if the Windows server requires PPP callback clients to send callback numbers.

Examples

```
# On Serial 2/1/0, specify a dial string of 1234567 for the Windows server to call back.
```

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

```
[Sysname] interface serial 2/1/0
```

```
[Sysname-Serial2/1/0] ppp callback ntstring 1234567
# On Dialer 1, specify a dial string of 1234567 for the Windows server to call back.
<Sysname> system-view
[Sysname] interface dialer 1
[Sysname-Dialer1] ppp callback ntstring 1234567
```

reset counters interface

Use **reset counters interface** to clear the statistics of a dialer interface.

Syntax

```
reset counters interface [ dialer [ interface-number ] ]
```

Views

User view

Predefined user roles

network-admin

Parameters

dialer [*interface-number*]: Specifies a dialer interface by its number. If you do not specify the **dialer** keyword, this command clears statistics for all interfaces. If you specify the **dialer** keyword, this command clears statistics for all dialer interfaces. If you specify a dialer interface, this command clears statistics for the specified dialer interface.

Usage guidelines

Use this command to clear history statistics if you want to collect traffic statistics for a specific time period.

Examples

```
# Clear the statistics of Dialer 1.
<Sysname> reset counters interface dialer 1
```

Related commands

```
display interface dialer
```

shutdown

Use **shutdown** to shut down a dialer interface.

Use **undo shutdown** to bring up a dialer interface.

Syntax

```
shutdown
undo shutdown
```

Default

A dialer interface is up.

Views

Dialer interface view

Predefined user roles

network-admin

Examples

```
# Shut down Dialer 1.
<Sysname> system-view
[Sysname] interface dialer 1
[Sysname-Dialer1] shutdown
```

standby routing-group

Use **standby routing-group** to assign a dialup interface to a dynamic route backup group.

Use **undo standby routing-group** to remove a dialup interface from a dynamic route backup group.

Syntax

```
standby routing-group group-number
undo standby routing-group group-number
```

Default

A dialup interface is not assigned to any dynamic route backup group.

Views

Dialup interface view

Predefined user roles

network-admin

Parameters

group-number: Specifies a dynamic route backup group by its number in the range of 1 to 255.

Usage guidelines

Before assigning a dialup interface to a dynamic route backup group, make sure DDR is enabled on the interface.

A dialup interface can be assigned to multiple dynamic route backup groups.

Examples

```
# Assign dialup interface Dialer 1 to dynamic route backup group 1.
<Sysname> system-view
[Sysname] interface dialer 1
[Sysname-Dialer1] standby routing-group 1
```

standby routing-group rule

Use **standby routing-group rule** to create a dynamic route backup group or add a network to be monitored to the group.

Use **undo standby routing-group rule** to delete a dynamic route backup group or remove a monitored network from the group.

Syntax

```
standby routing-group group-number rule ip ip-address { mask | mask-length } [ vpn-instance vpn-instance-name ]
undo standby routing-group group-number rule [ ip ip-address { mask | mask-length } ] [ vpn-instance vpn-instance-name ]
```

Default

No dynamic route backup group exists.

Views

System view

Predefined user roles

network-admin

Parameters

group-number: Specifies the number of the dynamic route backup group, in the range of 1 to 255.

ip *ip-address*: Specifies the IP address of the network to be monitored.

mask: Specifies the network mask.

mask-length: Specifies the network mask length in the range of 0 to 32.

vpn-instance *vpn-instance-name*: Specifies an MPLS L3VPN instance by its name, a case-sensitive string of 1 to 31 characters.

Usage guidelines

You can add a maximum of 255 monitored networks to a dynamic route backup group. DDR determines that the primary link is disconnected only when there are no valid routes to any of the networks monitored by the dynamic route backup group.

Examples

```
# Create dynamic route backup group 1 to monitor routes to the networks 20.0.0.0/8 and 30.0.0.0/8.
<Sysname> system-view
[Sysname] standby routing-group 1 rule ip 20.0.0.1 255.0.0.0
[Sysname] standby routing-group 1 rule ip 30.0.0.1 255.0.0.0
```

standby timer routing-disable

Use **standby timer routing-disable** to set the secondary link disconnection delay.

Use **undo standby timer routing-disable** to restore the default.

Syntax

standby timer routing-disable *delay*

undo standby timer routing-disable

Default

The secondary link disconnection delay is 20 seconds.

Views

Dialup interface view

Predefined user roles

network-admin

Parameters

delay: Specifies the secondary link disconnection delay in the range of 0 to 65535 seconds.

Examples

```
# Set the secondary link disconnection delay to 5 seconds on Dialer 1.
<Sysname> system-view
```

```
[Sysname] interface dialer 1
[Sysname-Dialer1] standby timer routing-disable 5
```

timer-hold

Use **timer-hold** to set the keepalive interval.

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

Syntax

```
timer-hold seconds
```

```
undo timer-hold
```

Default

The keepalive interval is 10 seconds.

Views

Dialer interface view

Predefined user roles

network-admin

Parameters

seconds: Specifies the interval for sending keepalive packets, in the range of 0 to 32767 seconds. The value 0 disables keepalive packet sending.

Usage guidelines

On an interface encapsulated with PPP, the data link layer sends keepalive packets at keepalive intervals to detect the availability of the remote end. The data link layer determines that the peer end is down if it has not received any keepalive messages when the keepalive retry limit is reached. The data link layer then reports the link down event to the upper-layer protocols.

To set the keepalive retry limit, use the **timer-hold retry** command.

On a slow link, increase the keepalive interval to prevent false shutdown of the interface. This situation might occur when keepalive packets are delayed because a large packet is being transmitted on the link.

Examples

```
# Set the keepalive interval to 1000 seconds on Dialer 1.
```

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

```
[Sysname] interface dialer 1
```

```
[Sysname-Dialer1] timer-hold 1000
```

Related commands

```
timer-hold retry
```

timer-hold retry

Use **timer-hold retry** to set the keepalive retry limit.

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

Syntax

```
timer-hold retry retries
```

```
undo timer-hold retry
```

Default

The keepalive retry limit is 5.

Views

Dialer interface view

Predefined user roles

network-admin

Parameters

retries: Specifies the maximum number of keepalive retransmission attempts, in the range of 1 to 255.

Usage guidelines

The interface determines that the remote end is down if it has not received a keepalive response when the keepalive retry limit is reached.

On a slow link, increase the keepalive retry limit to prevent false shutdown of the interface. This situation might occur when keepalive packets are delayed because a large packet is being transmitted on the link.

Examples

Set the keepalive retry limit to 10 on Dialer 1.

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

```
[Sysname] interface dialer 1
```

```
[Sysname-Dialer1] timer-hold retry 10
```

Related commands

timer-hold