# HP MSR Router Series

## Fundamentals
## Command Reference(V7)

# Contents

# Basic CLI commands

## command-alias enable

Use **command-alias enable** to enable the command keyword alias function.

Use **undo command-alias enable** to disable the command keyword alias function.

### Syntax

**command-alias enable**

**undo command-alias enable**

### Default

The command keyword alias function is disabled.

### Views

System view

### Predefined user roles

network-admin

### Usage guidelines

Configured command keyword aliases take effect only when the command keyword alias function is enabled.

Disabling the command keyword alias function does not delete configured aliases.

### Examples

# Enable the command keyword alias function.

```
<Sysname> system-view
[Sysname] command-alias enable
```

### Related commands

- **command-alias mapping**
- **display command-alias**

## command-alias mapping

Use **command-alias mapping** to configure a command keyword alias.

Use **undo command-alias mapping** to delete a command keyword alias.

### Syntax

**command-alias mapping** *cmdkey alias*

**undo command-alias mapping** *cmdkey*

### Default

A command keyword has no alias.

### Views

System view

### Predefined user roles

network-admin

### Parameters

*cmdkey*: Specifies the first keyword of a non-undo command or the second keyword of an **undo** command. You must enter the keyword in its complete form.

*alias*: Specifies an alias for the keyword. It must be different from the first keyword of any non-undo command and the second keyword of any **undo** command.

### Usage guidelines

You can configure an alias for the first keyword of a non-undo command or the second keyword of an **undo** command. Then, when you execute a command that starts with the keyword or the **undo** keyword plus the keyword, you can use the alias. For example, if you configure **show** as the alias for the **display** keyword, you can enter **show clock** to execute the **display clock** command.

To use configured command keyword aliases, make sure the **command-alias enable** command is configured.

### Examples

# Define **show** as the alias of the **display** keyword.
```
<Sysname> system-view
[Sysname] command-alias mapping display show
```

### Related commands

- **command-alias enable**
- **display command-alias**

# display | { begin | exclude | include }

Use **display | { begin | exclude | include }** to filter the output from a **display** command with a regular expression.

### Syntax

**display** *command* **| { begin | exclude | include }** *regular-expression*

### Views

Any view

### Predefined user roles

network-admin

network-operator

### Parameters

*command*: Specifies the keywords and arguments of a **display** command. To display available keywords and arguments, enter **display ?**.

**begin**: Displays the first line matching the specified regular expression and all subsequent lines.

**exclude**: Displays all lines not matching the specified regular expression.

**include**: Displays all lines matching the specified regular expression.

*regular-expression*: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

### Usage guidelines

Use the **|** { **begin** | **exclude** | **include** } *regular-expression* option with a **display** command to filter the command output. For more information about regular expressions, see *Fundamentals Configuration Guide*.

### Examples

# Display the lines that contain "vlan" in the running configuration.

```
<Sysname> display current-configuration | include vlan
vlan 1
vlan 999
 port access vlan 999
```

# display | by-linenum

Use **display | by-linenum** to number each output line for a **display** command.

### Syntax

**display** *command* **| by-linenum**

### Views

Any view

### Predefined user roles

network-admin

network-operator

### Parameters

*command*: Specifies the keywords and arguments of a **display** command. To display available keywords and arguments, enter **display ?**.

### Usage guidelines

By numbering each output line from a **display** command, you can easily identify the lines of interest.

Each line number is displayed as a 5-character string and might be followed by a colon (:) or hyphen (-). If you specify the **| by-linenum** option and the **| begin** *regular-expression* option for a **display** command, a hyphen is displayed for all lines that do not match the regular expression.

### Examples

# Display VLAN 999 settings, with each output line identified by a number.

```
<Sysname> display vlan 999 | by-linenum
    1:  VLAN ID: 999
    2:  VLAN type: Static
    3:  Route interface: Configured
    4:  IP address: 192.168.2.1
    5:  Subnet mask: 255.255.255.0
    6:  Description: For LAN Access
    7:  Name: VLAN 0999
    8:  Tagged ports:   None
```

```
     9:  Untagged ports:
    10:      GigabitEthernet2/1/0
```

# Display the first line that begins with "user-group" in the running configuration and all of the following lines.

```
<Sysname> display current-configuration | by-linenum begin user-group
  114:  user-group system
  115-  #
  116-  return
```

# display >

Use **display >** to save the output from a **display** command to a separate file.

# Save VLAN 1 settings to a separate file named **vlan.txt**.

```
<Sysname> display vlan 1 > vlan.txt
```

# Verify the content of the **vlan.txt** file.

```
<Sysname> more vlan.txt
VLAN ID: 1
 VLAN type: Static
 Route interface: Not configured
 Description: VLAN 0001
 Name: VLAN 0001
 Tagged ports:   None
 Untagged ports:
    GigabitEthernet2/1/0
```

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# display >>

Use **display >>** to append the output from a **display** command to the end of a file.

**Syntax**

**display** *command* **>>** *filename*

**Views**

Any view

**Predefined user roles**

network-admin

network-operator

**Parameters**

*command*: Specifies the keywords and arguments of a **display** command. To display available keywords and arguments, enter **display ?**.

*filename*: Specifies the name of the file that is used to save the output, a string of 1 to 63 characters.

**Usage guidelines**

The **display** commands show the configuration, statistics, and states of the device. You can use **display >>** to save the output to a file.

If the specified file does not exist, the system creates the file and saves the output to the file. If the file already exists, the system appends the output to the end of the file.

**Examples**

# Append the VLAN 999 settings to the end of the **vlan.txt** file.
```
<Sysname> display vlan 999 >> vlan.txt
<Sysname>
```

# Check the content of the **vlan.txt** file.
```
<Sysname> more vlan.txt
VLAN ID: 1
 VLAN type: Static
 Route interface: Not configured
 Description: VLAN 0001
 Name: VLAN 0001
 Tagged ports:   None
 Untagged ports:
    GigabitEthernet2/1/0

VLAN ID: 999
 VLAN type: Static
 Route interface: Configured
 IP address: 192.168.2.1
 Subnet mask: 255.255.255.0
 Description: For LAN Access
 Name: VLAN 0999
 Tagged ports:   None
 Untagged ports:
```

```
        GigabitEthernet2/1/1
```

# display command-alias

Use **display command-alias** to display the status of the command keyword alias function and the configured command keyword alias.

## Syntax

**display command-alias**

## Views

Any view

## Predefined user roles

network-admin

network-operator

## Examples

# Display command keyword alias information.

```
<Sysname> display command-alias
Command alias is enabled
Index Alias              Command key
1     ping1              ping
2     ssh1               ssh
```

## Related commands

- **command-alias enable**
- **command-alias mapping**

# display history-command

Use **display history-command** to display all commands that are saved in the command history buffer for the current CLI session.

## Syntax

**display history-command**

## Views

Any view

## Predefined user roles

network-admin

network-operator

## Usage guidelines

The system automatically saves commands you have successfully executed to the command history buffer for the current CLI session. You can view them and execute them again.

By default, the system can save up to 10 commands in the buffer. You can use the **history-command max-size** command to change the buffer size.

## Examples

# Display all commands saved in the command history buffer for the current CLI session.

```
<Sysname> display history-command
  system-view
  vlan 2
  quit
```

## Related commands

**history-command max-size**

# display history-command all

Use **display history-command all** to display all commands saved in the command history buffer for all CLI sessions.

## Syntax

**display history-command all**

## Views

Any view

## Predefined user roles

network-admin

network-operator

## Usage guidelines

The system automatically saves commands successfully executed by users to the command history buffer for all CLI sessions. Users can view them and execute them again.

Up to 1024 commands can be saved in the command history buffer. When this number is reached, the system deletes the earliest commands to make room for newly executed commands.

## Examples

# Display all commands saved in the command history buffer for all CLI sessions.

```
<Sysname> display history-command all
  Date       Time      Terminal   Ip             User
  03/16/2012 20:03:33 vty0        192.168.1.26   **
  Cmd: display history-command all

  03/16/2012 20:03:29 vty0        192.168.1.26   **
  Cmd: system-view
```

## Related commands

**display history-command**

# display hotkey

Use **display hotkey** to display hotkey information.

## Syntax

**display hotkey**

## Views

Any view

## Predefined user roles

network-admin

network-operator

## Examples

# Display hotkey information.

```
<Sysname> display hotkey
---------------- Hotkeys ----------------
            -Defined command hotkeys-
CTRL_G display current-configuration
CTRL_L display ip routing-table
CTRL_O undo debugging all


            -Undefined command hotkeys-
CTRL_T NULL
CTRL_U NULL


            -System-reserved hotkeys-
CTRL_A  Move the cursor to the beginning of the line.
CTRL_B  Move the cursor one character to the left.
CTRL_C  Stop the current command.
CTRL_D  Erase the character at the cursor.
CTRL_E  Move the cursor to the end of the line.
CTRL_F  Move the cursor one character to the right.
CTRL_H  Erase the character to the left of the cursor.
CTRL_K  Abort the connection request.
CTRL_N  Display the next command in the history buffer.
CTRL_P  Display the previous command in the history buffer.
CTRL_R  Redisplay the current line.
CTRL_V  Paste text from the clipboard.
CTRL_W  Delete the word to the left of the cursor.
CTRL_X  Delete all characters from the beginning of the line to the cursor.
CTRL_Y  Delete all characters from the cursor to the end of the line.
CTRL_Z  Return to the User View.
CTRL_]  Kill incoming connection or redirect connection.
ESC_B   Move the cursor back one word.
ESC_D   Delete all characters from the cursor to the end of the word.
ESC_F   Move the cursor forward one word.
ESC_N   Move the cursor down a line.
ESC_P   Move the cursor up a line.
ESC_<   Move the cursor to the beginning of the clipboard.
ESC_>   Move the cursor to the end of the clipboard.
```

## Related commands

**hotkey**

# hotkey

Use **hotkey** to assign a command to a configurable hotkey.

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

## Syntax

**hotkey** { **CTRL_G** | **CTRL_L** | **CTRL_O** | **CTRL_T** | **CTRL_U** } *command*

**undo hotkey** { **CTRL_G** | **CTRL_L** | **CTRL_O** | **CTRL_T** | **CTRL_U** }

## Default

- **Ctrl_G**: **display current-configuration** (display the running configuration).
- **Ctrl_L**: **display ip routing-table** (display the IPv4 routing table information).
- **Ctrl_O**: **undo debugging all** (disable all debugging functions).
- **Ctrl_T**: No command is assigned to this hotkey.
- **Ctrl_U**: No command is assigned to this hotkey.

## Views

System view

## Predefined user roles

network-admin

## Parameters

**CTRL_G**: Assigns a command to **Ctrl+G**.

**CTRL_L**: Assigns a command to **Ctrl+L**.

**CTRL_O**: Assigns a command to **Ctrl+O**.

**CTRL_T**: Assigns a command to **Ctrl+T**.

**CTRL_U**: Assigns a command to **Ctrl+U**.

*command*: Specifies the command to be assigned to the hotkey.

## Usage guidelines

The system defines some hotkeys and provides five configurable command hotkeys. Pressing a hotkey executes the command assigned to the hotkey.

To display system-defined and configurable hotkeys, use the **display hotkey** command.

## Examples

# Assign the **display tcp status** command to the hotkey **Ctrl+T**.
```
<Sysname> system-view
[Sysname] hotkey ctrl_t display tcp status
```

## Related commands

**display hotkey**

# quit

Use **quit** to return to the upper-level view.

**Syntax**

> **quit**

**Views**

> Any view

**Predefined user roles**

> network-admin
>
> network-operator

**Usage guidelines**

> Executing this command in user view disconnects you from the device.

**Examples**

> # Return from GigabitEthernet 2/1/0 interface view to system view and then to user view.
>
> ```
> [Sysname-GigabitEthernet2/1/0] quit
> [Sysname] quit
> <Sysname>
> ```

# return

> Use **return** to return to user view from any other view.

**Syntax**

> **return**

**Views**

> Any view except user view

**Predefined user roles**

> network-admin
>
> network-operator

**Usage guidelines**

> Pressing **Ctrl+Z** has the same effect as the **return** command.

**Examples**

> # Return to user view from GigabitEthernet 2/1/0 interface view.
>
> ```
> [Sysname-GigabitEthernet2/1/0] return
> <Sysname>
> ```

# screen-length disable

> Use **screen-length disable** to disable pausing between screens of output for the current session.
>
> Use **undo screen-length disable** to enable pausing between screens of output for the current session.

**Syntax**

> **screen-length disable**
>
> **undo screen-length disable**

## Default

The default varies by settings of the **screen-length** command in user line view.

The following are default settings for the **screen-length** command:

- Pausing between screens of output.
- Displaying up to 24 lines on a screen.

## Views

User view

## Predefined user roles

network-admin

## Usage guidelines

If you disable pausing between screens of output, all output is displayed. The screen is refreshed continuously until the final screen is displayed.

This command takes effect only for the current session. When you are logged out, the default is restored.

## Examples

# Disable pausing between screens of output for the current session.
```
<Sysname> screen-length disable
```

## Related commands

**screen-length**

# system-view

Use **system-view** to enter system view from user view.

## Syntax

**system-view**

## Views

User view

## Predefined user roles

network-admin

network-operator

## Examples

# Enter system view from user view.
```
<Sysname> system-view
System View: return to User View with Ctrl+Z.
[Sysname]
```

# RBAC commands

The device supports the FIPS mode that complies with NIST FIPS 140-2 requirements. Support for features, commands, and parameters might differ in FIPS mode and non-FIPS mode. For more information about FIPS mode, see *Security Configuration Guide*.

## description

Use **description** to configure a description for a user role.

Use **undo description** to delete the description of a user role.

### Syntax

**description** *text*

**undo description**

### Default

A user role does not have a description.

### Views

User role view

### Predefined user roles

network-admin

### Parameters

*text*: User role description, a case-sensitive string of 1 to 128 characters.

### Examples

# Configure the description as **labVIP** for the user role **role1**.

```
<Sysname> system-view
[Sysname] role name role1
[Sysname-role-role1] description labVIP
```

### Related commands

- **display role**
- **role**

## display role

Use **display role** to display user role information.

### Syntax

**display role** [ **name** *role-name* ]

### Views

Any view

### Predefined user roles

network-admin

network-operator

### Parameters

**name** *role-name*: Specifies a user role name, a case-sensitive string of 1 to 63 characters.

### Usage guidelines

If you do not specify a user role name, the command displays information about all user roles, including the predefined user roles.

### Examples

# Display information about the user role **123**.

```
<Sysname> display role name 123
Role: 123
  Description: new role
  VLAN policy: deny
  Permitted VLANs: 1 to 5, 7 to 8
  Interface policy: deny
  Permitted interfaces: GigabitEthernet2/1/0 to GigabitEthernet2/1/1, Vlan-interface1 to
Vlan-interface20
  VPN instance policy: deny
  Permitted VPN instances: vpn, vpn1, vpn2
  -----------------------------------------------------------------
  Rule    Perm   Type  Scope         Entity
  -----------------------------------------------------------------
  1       permit RWX   feature-group abc
  2       deny   -W-   feature       ldap
  3       permit       command       system ; radius sc *
  4       permit R--   xml-element   -
  R:Read W:Write X:Execute
```

# Display information about all user roles.

```
<Sysname> display role
Role: network-admin
  Description: Predefined network admin role has access to all commands on the d
evice
  VLAN policy: permit (default)
  Interface policy: permit (default)
  VPN instance policy: permit (default)
  -----------------------------------------------------------------
  Rule    Perm   Type  Scope         Entity
  -----------------------------------------------------------------
  sys-1   permit       command       *
  sys-2   permit RWX   xml-element   -
  sys-3   deny         command       display security-logfile summary
  sys-4   deny         command       system-view ; info-center securi
                                     ty-logfile directory *
  sys-5   deny         command       security-logfile save
  R:Read W:Write X:Execute
```

```
Role: network-operator
  Description: Predefined network operator role has access to all read commands
on the device
  VLAN policy: permit (default)
  Interface policy: permit (default)
  VPN instance policy: permit (default)
  ----------------------------------------------------------------
  Rule    Perm   Type   Scope       Entity
  ----------------------------------------------------------------
  sys-1   permit        command     display *
  sys-2   permit        command     xml
  sys-3   deny          command     display history-command all
  sys-4   deny          command     display exception *
  sys-5   deny          command     display cpu-usage configuration
                                    *
  sys-6   deny          command     display kernel exception *
  sys-7   deny          command     display kernel deadloop *
  sys-8   deny          command     display kernel starvation *
  sys-9   deny          command     display kernel reboot *
  sys-10  deny          command     display memory trace *
  sys-11  deny          command     display kernel memory *
  sys-12  permit        command     system-view ; local-user *
  sys-13  permit        command     system-view ; switchto mdc *
  sys-14  permit R--    xml-element -
  sys-15  deny          command     display security-logfile summary
  sys-16  deny          command     system-view ; info-center securi
                                    ty-logfile directory *
  sys-17  deny          command     security-logfile save
  R:Read W:Write X:Execute

Role: level-0
  Description: Predefined level-0 role
  VLAN policy: permit (default)
  Interface policy: permit (default)
  VPN instance policy: permit (default)
  ----------------------------------------------------------------
  Rule    Perm   Type   Scope       Entity
  ----------------------------------------------------------------
  sys-1   permit        command     tracert *
  sys-2   permit        command     telnet *
  sys-3   permit        command     ping *
  sys-4   permit        command     ssh2 *
  sys-5   permit        command     super *
  R:Read W:Write X:Execute
…
```

Table 1 Command output

| Field | Description |
|---|---|
| Role | User role name.<br>Predefined user role names:<br>• network-admin.<br>• network-operator.<br>• level-*n* (where n represents an integer in the range of 0 to 15). |
| Description | User role description you have configured for easy identification. |
| VLAN policy | VLAN policy of the user role:<br>• **deny**—Denies access to any VLAN except permitted VLANs.<br>• **permit (default)**—Default VLAN policy, which enables the user role to access any VLAN. |
| Permitted VLANs | VLANs accessible to the user role. |
| Interface policy | Interface policy of the user role:<br>• **deny**—Denies access to any interface except permitted interfaces.<br>• **permit (default)**—Default interface policy, which enables the user role to access any interface. |
| Permitted interfaces | Interfaces accessible to the user role. |
| VPN instance policy | VPN instance policy of the user role:<br>• **deny**—Denies access to any VPN except permitted VPNs.<br>• **permit (default)**—Default VPN instance policy, which enables the user role to access any VPN instance. |
| Permitted VPN instances | VPNs accessible to the user role. |
| Rule | User role rule number.<br>A user role rule specifies access permissions to items, including commands, feature-specific commands, and XML elements.<br>Predefined user role rules are identified by sys-n, where n represents an integer. |
| Perm | Access control type:<br>• **permit**—User role has access to the specified items.<br>• **deny**—User role does not have access to the specified items. |
| Type | Controlled type:<br>• **R**—Read-only.<br>• **W**—Write.<br>• **X**—Execute. |
| Scope | Rule control scope:<br>• **command**—Controls access to the command or commands, as specified in the **Entity** field.<br>• **feature**—Controls access to the commands of the feature, as specified in the **Entity** field.<br>• **feature-group**—Controls access to the commands of the features in the feature group, as specified in the **Entity** field.<br>• **xml-element**—Controls access to XML elements. |

| Field | Description |
|---|---|
| Entity | Command string, feature name, feature group, or XML element specified in the user role rule:<br>• An en dash (–) represents any feature.<br>• An asterisk (*) represents zero or more characters. |

**Related commands**

**role**

# display role feature

Use **display role feature** to display features available in the system.

**Syntax**

**display role feature** [ **name** *feature-name* | **verbose** ]

**Views**

Any view

**Predefined user roles**

network-admin

network-operator

**Parameters**

**name** *feature-name*: Displays the commands of a feature. The *feature-name* argument specifies the feature name, and all letters must be in lowercase.

**verbose**: Displays the commands of each feature.

**Usage guidelines**

If you specify neither **name** *feature-name* nor **verbose**, the **display role feature** command displays only the list of features available in the system.

**Examples**

# Display the list of feature names.

```
<Sysname> display role feature
Feature: device          (Device configuration related commands)
Feature: interface       (Interface related commands)
Feature: syslog          (Syslog related commands)
Feature: process         (Process related commands)
…
```

# Display the commands of each feature.

```
<Sysname> display role feature verbose
Feature: device          (Device configuration related commands)
  display clock    (R)
  debugging dev    (W)
  display debugging dev    (R)
  display device *    (R)
  display diagnostic-information    (R)
```

```
  display environment *    (R)
  display fan *     (R)
  display power *     (R)
  display rps *     (R)
  display current-configuration *    (R)
  display saved-configuration *    (R)
  display startup    (R)
  display this *    (R)
  display version    (R)
  clock datetime *    (W)
  reboot *    (W)
  save *    (W)
  startup saved-configuration *    (W)
  system-view ; temperature-limit *    (W)
  system-view ; sysname *    (W)
  system-view ; clock timezone *    (W)
  system-view ; configuration replace file *    (W)
  system-view ; user-interface * ; idle-timeout *    (W)
Feature: interface        (Interface related commands)
  reset counters interface *    (W)
  debugging ifnet *    (W)
  display port-group manual *    (R)
  display debugging ifnet    (R)
  display interface *    (R)
…
```

# Display the commands of the **aaa** feature.

```
<Sysname> display role feature name aaa
Feature: aaa              (AAA related commands)
  system-view ; domain *    (W)
  system-view ; header *    (W)
  system-view ; aaa *    (W)
  display domain *    (R)
  system-view ; user-group *    (W)
  system-view ; local-user *    (W)
  display local-user *    (R)
  display user-group *    (R)
  display debugging local-server    (R)
  debugging local-server *    (W)
  super *    (X)
  display password-control *    (R)
  reset password-control *    (W)
  system-view ; password-control *    (W)
```

**Table 2 Command output (display role feature name aaa)**

| Field | Description |
| --- | --- |
| Feature | Displays the name and brief function description of the feature. |

| Field | Description |
|---|---|
| system-view ; domain * | All the commands that start with **domain** in system view and all the commands in ISP domain view. |
| system-view ; header * | All the commands that start with **header** in system view. |
| system-view ; aaa * | All the commands that start with **aaa** in system view. |
| display domain * | All the commands that start with **display domain** in user view. |
| system-view ; user-group * | All the commands that start with **user-group** in system view, and all the commands in user group view. |
| system-view ; local-user * | All the commands that start with **local-user** in system view, and all the commands in local user view. |
| display user-group * | All the commands that start with **display user-group** in user view. |
| display debugging local-server | All the commands that start with **display debugging local-server** in user view. |
| debugging local-server * | All the commands that start with **debugging local-server** in user view. |
| super * | All the commands that start with **super** in user view. |
| display password-control * | All the commands that start with **display password-control** in user view. |
| reset password-control * | All the commands that start with **reset password-control** in user view. |
| system-view ; password-control * | All the commands that start with **password-control** in system view. |
| (W) | Command type is Write. A write command configures the system. |
| (R) | Command type is Read. A read command displays configuration or maintenance information. |
| (X) | Command type is Execute. An execute command executes a specific function. |

**Related commands**

**feature**

# display role feature-group

Use **display role feature-group** to display feature group information.

**Syntax**

**display role feature-group** [ **name** *feature-group-name* ] [ **verbose** ]

**Views**

Any view

**Predefined user roles**

network-admin

network-operator

## Parameters

**name** *feature-group-name*: Specifies a feature group. The *feature-group-name* argument represents the feature group name, a case-sensitive string of 1 to 31 characters. If you do not specify a feature group, the command displays information about all feature groups.

**verbose**: Displays the commands of each feature in the specified feature group. If you do not specify a feature group, this keyword enables displaying the commands of each feature in every feature group. If you do not specify this keyword, the command displays only the feature lists of feature groups.

## Usage guidelines

Feature groups **L2** and **L3** are predefined feature groups.

## Examples

# Display the feature lists of feature groups.
```
<Sysname> display role feature-group
Feature group: L2
Feature: igmp-snooping   (IGMP-Snooping related commands)
Feature: mld-snooping    (MLD-Snooping related commands)
Feature: stp             (STP related commands)
Feature: lldp            (LLDP related commands)
Feature: loopbk-detect   (Loopback-detection related commands)
Feature: vlan            (Virtual LAN related commands)
Feature: port-security   (Port-security related commands)


Feature group: L3
Feature: route           (Route management related commands)
Feature: usr             (Unicast static route related commands)
Feature: ospf            (Open Shortest Path First protocol related commands)
Feature: rip             (Routing Information Protocol related commands)
Feature: isis            (ISIS protocol related commands)
Feature: bgp             (Border Gateway Protocol related commands)
Feature: l3vpn           (Layer 3 Virtual Private Network related commands)
Feature: route-policy    (Routing Policy related commands)
Feature: mt              (multiple-topology related commands)
Feature: multicast       (Multicast related commands)
Feature: pim             (Protocol Independent Multicast related commands)
Feature: igmp            (Internet Group Management Protocol related commands)
Feature: mld             (Multicast Listener Discovery related commands)
Feature: mcast-domain    (Multicast Domain related commands)
Feature: msdp            (Multicast Source Discovery Protocol related ommands)
```

# Display the commands in each feature group. For more information about the wildcards and marks used in the command list, see Table 2.
```
<Sysname> display role feature-group verbose
Feature group: L2
Feature: igmp-snooping   (IGMP-Snooping related commands)
  system-view ; igmp-snooping    (W)
  system-view ; vlan * ; igmp-snooping *    (W)
  system-view ; interface * ; igmp-snooping *    (W)
  display igmp-snooping *    (R)
```

```
  reset igmp-snooping *    (W)
  debugging igmp-snooping *    (W)
  display debugging igmp-snooping *    (R)
  system-view ; probe * ; debugging system internal igmp-snooping *    (W)
Feature: mld-snooping    (MLD-Snooping related commands)
  system-view ; mld-snooping    (W)
  system-view ; vlan * ; mld-snooping *    (W)
  system-view ; interface * ; mld-snooping *    (W)
  display mld-snooping *    (R)
  reset mld-snooping *    (W)
  debugging mld-snooping *    (W)
  display debugging mld-snooping *    (R)
  system-view ; probe * ; debugging system internal mld-snooping *    (W)
Feature: stp              (STP related commands)
  display stp *    (R)
  system-view ; stp *    (W)
  system-view ; interface * ; stp *    (W)
  reset stp *    (W)
  debugging stp *    (W)
  display debugging stp *    (R)
  system-view ; probe ; display system internal stp *    (R)
  system-view ; probe ; debugging system internal stp *    (W)
  system-view ; probe ; debugging system internal stg *    (W)
…
```

# Display the feature list of the feature group **L3**.

```
<Sysname> display role feature-group name L3
Feature group: L3
Feature: route          (Route management related commands)
Feature: usr            (Unicast static route related commands)
Feature: ospf           (Open Shortest Path First protocol related commands)
Feature: rip            (Routing Information Protocol related commands)
Feature: isis           (ISIS protocol related commands)
Feature: bgp            (Border Gateway Protocol related commands)
Feature: l3vpn          (Layer 3 Virtual Private Network related commands)
Feature: mt             (multiple-topology related commands)
Feature: route-policy   (Routing Policy related commands)
Feature: multicast      (Multicast related commands)
Feature: pim            (Protocol Independent Multicast related commands)
Feature: igmp           (Internet Group Management Protocol related commands)
Feature: mld            (Multicast Listener Discovery related commands)
Feature: mcast-domain   (Multicast Domain related commands)
Feature: msdp           (Multicast Source Discovery Protocol related commands)
```

## Related commands

- **feature**
- **role feature-group**

# feature

Use **feature** to add a feature to a feature group.

Use **undo feature** to remove a feature from a feature group.

## Syntax

**feature** *feature-name*

**undo feature** *feature-name*

## Default

A user-defined feature group does not have any features.

## Views

Feature group view

## Predefined user roles

network-admin

## Parameters

*feature-name*: Specifies a feature name. You must enter the feature name exactly as the feature name is displayed, including the case.

## Usage guidelines

Repeat the **feature** command to add multiple features to a feature group.

## Examples

# Add features AAA and ACL to feature group **1**.

```
<Sysname> system-view
[Sysname] role feature-group name 1
[Sysname-featuregrp-1] feature aaa
[Sysname-featuregrp-1] feature acl
```

## Related commands

- **display role feature**
- **display role feature-group**
- **role feature-group**

# interface policy deny

Use **interface policy deny** to enter user role interface policy view.

Use **undo interface policy deny** to restore the default user role interface policy.

## Syntax

**interface policy deny**

**undo interface policy deny**

## Default

A user role has access to any interface.

**Views**

User role view

**Predefined user roles**

network-admin

**Usage guidelines**

The **interface policy deny** command denies the access of a user role to any interface.

To restrict the interface access of a user role to only a set of interfaces:

1. Use **interface policy deny** to deny access to any interface.

2. Use **permit interface** to specify accessible interfaces.

To configure an interface, make sure the interface is permitted by the user role interface policy in use. You can perform the following tasks on an accessible interface:

- Create, remove, or configure the interface.
- Enter the interface view.
- Specify the interface in feature commands.

The create and remove operations are available only for logical interfaces.

Any change to a user role interface policy takes effect only on users who log in with the user role after the change.

**Examples**

# Deny the user role **role1** to access any interface.
```
<Sysname> system-view
[Sysname] role name role1
[Sysname-role-role1] interface policy deny
[Sysname-role-role1-ifpolicy] quit
```

# Deny the user role **role1** to access any interface except GigabitEthernet 2/1/0 to GigabitEthernet 2/1/4.
```
<Sysname> system-view
[Sysname] role name role1
[Sysname-role-role1] interface policy deny
[Sysname-role-role1-ifpolicy] permit interface gigabitethernet 2/1/0 to gigabitethernet
2/1/4
```

**Related commands**

- **display role**
- **permit interface**
- **role**

# permit interface

Use **permit interface** to configure a list of interfaces accessible to a user role.

Use **undo permit interface** to disable the access of a user role to specific interfaces.

**Syntax**

**permit interface** *interface-list*

**undo permit interface** [ *interface-list* ]

## Default

No permitted interfaces are configured in user role interface policy view. A user role cannot access any interface after you configure the **interface policy deny** command.

## Views

User role interface policy view

## Predefined user roles

network-admin

## Parameters

**interface** *interface-list*: Specifies a space-separated list of up to 10 interface items. Each interface item specifies one interface in the *interface-type interface-number* form or a range of interfaces in the *interface-type interface-number* **to** *interface-type interface-number* form. If you specify an interface range, the end interface must meet the following requirements:

- Be the same type as the start interface.
- Have a higher interface number than the start interface.

## Usage guidelines

To permit a user role to access an interface after you configure the **interface policy deny** command, you must add the interface to the permitted interface list of the policy. With the user role, you can perform the following tasks to the interfaces in the permitted interface list:

- Create, remove, or configure the interfaces.
- Enter the interface views.
- Specify the interfaces in feature commands.

The create and remove operations are available only for logical interfaces.

You can repeat the **permit interface** command to add permitted interfaces to a user role interface policy.

The **undo permit interface** command removes the entire list of permitted interfaces if you do not specify any interfaces.

Any change to a user role interface policy takes effect only on users who log in with the user role after the change.

## Examples

1.  Configure user role **role1**:

    # Permit the user role **role1** to execute all commands available in interface view and VLAN view.
    ```
    <Sysname> system-view
    [Sysname] role name role1
    [Sysname-role-role1] rule 1 permit command system-view ; interface *
    [Sysname-role-role1] rule 2 permit command system-view ; vlan *
    ```
    # Permit the user role to access GigabitEthernet 2/1/0, and GigabitEthernet 2/1/4 to GigabitEthernet 2/1/6.
    ```
    [Sysname-role-role1] interface policy deny
    [Sysname-role-role1-ifpolicy] permit interface gigabitethernet 2/1/0
    gigabitethernet 2/1/4 to gigabitethernet 2/1/6
    ```

2.  Verify that you cannot use the user role to work on any interfaces except GigabitEthernet 2/1/0 and GigabitEthernet 2/1/4 to GigabitEthernet 2/1/6:

# Verify that you can enter GigabitEthernet 2/1/0 interface view.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 2/1/0
[Sysname-GigabitEthernet2/1/0]
```

# Verify that you can assign GigabitEthernet 2/1/4 to VLAN 10. In this example, the user role can access any VLAN because the default VLAN policy of the user role is used.

```
<Sysname> system-view
[Sysname] vlan 10
[Sysname-vlan10] port gigabitethernet 2/1/4
```

# Verify that you cannot enter GigabitEthernet 2/1/2 interface view.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 2/1/2
Permission denied.
```

## Related commands

- **display role**
- **interface policy deny**
- **role**

# permit vlan

Use **permit vlan** to configure a list of VLANs accessible to a user role.

Use **undo permit vlan** to remove the permission for a user role to access specific VLANs.

## Syntax

**permit vlan** *vlan-id-list*

**undo permit vlan** [ *vlan-id-list* ]

## Default

No permitted VLANs are configured in user role interface policy view.

## Views

User role VLAN policy view

## Predefined user roles

network-admin

## Parameters

*vlan-id-list*: Specifies a space-separated list of up to 10 VLAN items. Each VLAN item specifies a VLAN by VLAN ID or specifies a range of VLANs in the form of *vlan-id1* **to** *vlan-id2*. The value range for the VLAN IDs is 1 to 4094. If you specify a VLAN range, *vlan-id2* must be greater than *vlan-id1*.

## Usage guidelines

To permit a user role to access a VLAN after you configure the **vlan policy deny** command, you must add the VLAN to the permitted VLAN list of the policy. With the user role, you can perform the following tasks on the VLANs in the permitted VLAN list:

- Create, remove, or configure the VLANs.
- Enter the VLAN views.

- Specify the VLANs in feature commands.

You can repeat the **permit vlan** command to add permitted VLANs to a user role VLAN policy.

The **undo permit vlan** command removes the entire list of permitted VLANs if you do not specify any VLANs.

Any change to a user role VLAN policy takes effect only on users who log in with the user role after the change.

### Examples

1. Configure user role **role1**:

   \# Permit the user role **role1** to execute all commands available in interface view and VLAN view.
   ```
   <Sysname> system-view
   [Sysname] role name role1
   [Sysname-role-role1] rule 1 permit command system-view ; interface *
   [Sysname-role-role1] rule 2 permit command system-view ; vlan *
   ```
   \# Permit the user role **role1** to access VLANs 2, 4, and 50 to 100.
   ```
   [Sysname-role-role1] vlan policy deny
   [Sysname-role-role1-vlanpolicy] permit vlan 2 4 50 to 100
   ```

2. Verify that you cannot use the user role to work on any VLAN except VLANs 2, 4, and 50 to 100:

   \# Verify that you can create VLAN 100 and enter the VLAN view.
   ```
   <Sysname> system-view
   [Sysname] vlan 100
   [Sysname-vlan100]
   ```
   \# Verify that you can add port GigabitEthernet 2/1/0 to VLAN 100 as an access port.
   ```
   <Sysname> system-view
   [Sysname] interface gigabitethernet 2/1/0
   [Sysname-GigabitEthernet2/1/0] port access vlan 100
   ```
   \# Verify that you cannot create VLAN 101 or enter the VLAN view.
   ```
   <Sysname> system-view
   [Sysname] vlan 101
   Permission denied.
   ```

### Related commands

- **display role**
- **role**
- **vlan policy deny**

# permit vpn-instance

Use **permit vpn-instance** to configure a list of VPNs accessible to a user role.

Use **undo permit vpn-instance** to disable the access of a user role to specific VPNs.

### Syntax

**permit vpn-instance** *vpn-instance-name*&<1-10>

**undo permit vpn-instance** [ *vpn-instance-name*&<1-10> ]

### Default

No permitted VPNs are configured in user role VPN instance policy.

### Views

User role VPN instance policy view

### Predefined user roles

network-admin

### Parameters

*vpn-instance-name*&<1-10>: Specifies a space-separated list of up to 10 MPLS L3VPN names. Each name is a case-sensitive string of 1 to 31 characters.

### Usage guidelines

To permit a user role to access an MPLS L3VPN after you configure the **vpn-instance policy deny** command, you must add the VPN to the permitted VPN list of the policy. With the user role, you can perform the following tasks on the VPNs in the permitted VPN list:

- Create, remove, or configure the VPNs.
- Enter the VPN instance views.
- Specify the VPNs in feature commands.

You can repeat the **permit vpn-instance** command to add permitted MPLS L3VPNs to a user role VPN instance policy.

The **undo permit vpn-instance** command removes the entire list of permitted VPNs if you do not specify any VPNs.

Any change to a user role VPN instance policy takes effect only on users who log in with the user role after the change.

### Examples

1.  Configure user role **role1**:

    # Permit the user role to execute all commands available in system view and in the child views of system view.

    ```
    <Sysname> system-view
    [Sysname] role name role1
    [Sysname-role-role1] rule 1 permit command system-view ; *
    ```

    # Permit the user role to access VPN 1.

    ```
    [Sysname-role-role1] vpn policy deny
    [Sysname-role-role1-vpnpolicy] permit vpn-instance vpn1
    ```

2.  Verify that you cannot use the user role to work on any VPN except VPN 1:

    # Verify that you can enter VPN1 view.

    ```
    <Sysname> system-view
    [Sysname] ip vpn-instance vpn1
    [Sysname-vpn-instance-vpn1]
    ```

    # Verify that you can assign the primary accounting server at 10.110.1.2 to the VPN in the RADIUS scheme **radius1**.

    ```
    <Sysname> system-view
    [Sysname] radius scheme radius1
    [Sysname-radius-radius1] primary accounting 10.110.1.2 vpn-instance vpn1
    ```

# Verify that you cannot create the VPN **vpn2** or enter the VPN instance view.

```
<Sysname> system-view
[Sysname] ip vpn-instance vpn2
Permission denied.
```

## Related commands

- **display role**
- **role**
- **vpn-instance policy deny**

# role

Use **role** to create a user role and enter user role view. If the user role has been created, you directly enter the user role view.

Use **undo role** to delete a user role.

## Syntax

**role name** *role-name*

**undo role name** *role-name*

## Default

The system has the following predefined user roles: network-admin, network-operator, and level-*n (where n* represents an integer in the range of 0 to 15).

## Views

System view

## Predefined user roles

network-admin

## Parameters

**name** *role-name*: Specifies a username. The *role-name* argument is a case-sensitive string of 1 to 63 characters.

## Usage guidelines

You can create up to 64 user roles in addition to the predefined user roles.

To change the permissions assigned to a user role, you must first enter the user role view.

You cannot delete the predefined user roles or change the permissions assigned to network-admin, network-operator, or level-15.

Level-0 to level-14 users can modify their own permissions for any commands except for the **display history-command all** command.

## Examples

# Create the user role **role1** and enter the user role view.

```
<Sysname> system-view
[Sysname] role name role1
[Sysname-role-role1]
```

## Related commands

- **display role**
- **interface policy deny**
- **rule**
- **vlan policy deny**
- **vpn-instance policy deny**

# role default-role enable

Use **role default-role enable** to enable the default user role feature for remote AAA users.

Use **undo role default-role enable** to restore the default.

## Syntax

**role default-role enable**

**undo role default-role enable**

## Default

The default user role function is disabled. AAA users who do not have a user role cannot log in to the device.

## Views

System view

## Predefined user roles

network-admin

## Usage guidelines

The default user role function allows AAA-authenticated users to access the system if the AAA server does not authorize any user roles to the users.

You can configure this function to enable an AAA-authenticated user who has not been assigned any user role to log in with the default user role network-operator.

If AAA users have been assigned user roles, they log in with the user roles.

## Examples

# Enable the default user role feature.

```
<Sysname> system-view
[Sysname] role default-role enable
```

## Related commands

**role**

# role feature-group

Use **role feature-group** to create a user role feature group and enter user role feature group view.

Use **undo role feature-group** to delete a user role feature group.

## Syntax

**role feature-group name** *feature-group-name*

**undo role feature-group name** *feature-group-name*

## Default

Two user role feature groups, **L2** and **L3**, are created.

## Views

System view

## Predefined user roles

network-admin

## Parameters

**name** *feature-group-name*: Specifies a feature group name. The *feature-group-name* argument is a case-sensitive string of 1 to 31 characters.

## Usage guidelines

The **L2** feature group includes all Layer 2 feature commands, and the **L3** feature group includes all Layer 3 feature commands. These predefined feature groups are not user configurable.

In addition to the predefined feature groups **L2** and **L3**, you can create up to 64 user role feature groups.

After you create a user role feature group, you can use the **display role feature** command to display the features available in the system. Then you can use the **feature** command to add features to the feature group.

## Examples

# Create the feature group **1**.

```
<Sysname> system-view
[Sysname] role feature-group name 1
[Sysname-featuregrp-1]
```

## Related commands

- **display role feature-group**
- **display role feature**
- **feature**

# rule

Use **rule** to create or change a user role rule for controlling command or XML element access.

Use **undo rule** to delete a user role rule.

## Syntax

**rule** *number* { **deny** | **permit** } { **command** *command-string* | { **execute** | **read** | **write** } * { **feature** [ *feature-name* ] | **feature-group** *feature-group-name* | **xml-element** [ *xml-string* ] } }

**undo rule** { *number* | **all** }

## Default

A user-defined user role does not have any rules and cannot use any command or XML element.

## Views

User role view

## Predefined user roles

network-admin

## Parameters

*number*: Specifies a rule number in the range of 1 to 256.

**deny**: Denies access to any specified commands or XML elements.

**permit**: Permits access to any specified commands or XML elements.

**command** *command-string*: Specifies a command string. The *command-string* argument is a case-sensitive string of 1 to 128 characters, including the following characters:

- The wildcard asterisk (*).
- The delimiters space and tab.
- All printable characters.

**execute**: Specifies the execute commands or XML elements. An execute command (for example, **ping**) or XML element executes a specific function or program.

**read**: Specifies the read commands or XML elements. A read command (for example, **display**, **dir**, **more**, or **pwd**) or XML element displays configuration or maintenance information.

**write**: Specifies the write commands or XML elements. A write command (for example, **ssh server enable**) or XML element configures the system.

**feature** [ *feature-name* ]: Specifies one or all features. The *feature-name* argument specifies a feature name. If you do not specify a feature name, you specify all the features in the system. When you specify a feature, you must enter the feature name as the name is displayed by **display role feature**, including the case.

**feature-group** *feature-group-name*: Specifies a user-defined or predefined feature group. The *feature-group-name* argument represents the feature group name, a case-sensitive string of 1 to 31 characters. If the feature group has not been created, the rule takes effect after the group is created. To display the feature groups that have been created, use the **display role feature-group** command.

**xml-element** [ *xml-string* ]: Specifies an XML element. The *xml-string* argument represents the XPath of the XML element, a case-insensitive string of 1 to 512 characters. Use the forward slash (/) to separate Xpath items, for example, Interfaces/Index/Name. If you do not specify any XML element, the rule applies to all XML elements.

**all**: Deletes all the user role rules.

## Usage guidelines

You can define the following types of rules for different access control granularities:

- **Command rule**—Controls access to a command or a set of commands that match a regular expression.
- **Feature rule**—Controls access to the commands of a feature by command type.
- **Feature group rule**—Controls access to the commands of a group of features by command type.
- **XML element rule**—Controls access to XML elements.

A user role can access the set of permitted commands and XML elements specified in the user role rules. User role rules include predefined (identified by sys-n) and user-defined user role rules.

- If two user-defined rules of the same type conflict, the one with the higher ID takes effect. For example, the user role can use the **tracert** command but not the **ping** command if the following rules exist:

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- o   Rule 1 that permits the **ping** command.
- o   Rule 2 that permits the **tracert** command.
- o   Rule 3 that denies the **ping** command.
- If a predefined user role rule and a user-defined user role rule conflict, the user-defined user role rule takes effect.

You can configure up to 256 user-defined rules for a user role. The total number of user-defined user role rules cannot exceed 1024.

Any rule modification, addition, or removal for a user role takes effect only on the users who log in with the user role after the change.

Access to the file system commands is controlled by both the file system command rules and the file system feature rule.

A command with output redirection to the file system is permitted only when the command type write is assigned to the file system feature.

When you specify a command string, follow the guidelines in Table 3.

**Table 3 Command string configuration rules**

| Rule | Guidelines |
| --- | --- |
| Semicolon (;) is the delimiter. | Use a semicolon to separate the command of each view that you must enter before you access a command or a set of commands. However, do not use a semicolon to separate commands available in user view or any view, for example, **display** and **dir**. |
| | Each semicolon-separated segment must have a minimum of one printable character. |
| | To specify the commands in a view but not the commands in the view's subviews, use a semicolon as the last printable character in the last segment. To specify the commands in a view and the view's subviews, the last printable character in the last segment must not be a semicolon. |
| | For example, you must enter system view before you enter interface view. To specify all commands starting with **ip** in any interface view, you must use the "system ; interface * ; ip * ;" command string. |
| | For another example, the "system ; radius scheme * ;" command string represents all the commands that start with **radius scheme** in system view. The "system ; radius scheme *" command string represents all the commands that start with **radius scheme** in system view and all the commands in RADIUS scheme view. |
| Asterisk (*) is the wildcard. | An asterisk represents zero or multiple characters. |
| | In a non-last segment, you can use an asterisk only at the end of the segment. |
| | In the last segment, you can use an asterisk in any position of the segment. If the asterisk appears at the beginning, you cannot specify any printable characters behind the asterisk. |
| | For example, the "system ; *" command string represents all commands available in system view and all subviews of the system view. The "debugging * event" command string represents all event debugging commands available in user view. |

| Rule | Guidelines |
|------|------------|
| Keyword abbreviation is allowed. | You can specify a keyword by entering the first few characters of the keyword. Any command that starts with this character string matches the rule.<br><br>For example, "rule 1 deny command dis mpls lsp protocol static asbr" denies access to the commands **display mpls lsp protocol static asbr** and **display mpls lsp protocol static-cr asbr**. |
| To control the access to a command, you must specify the command immediately after the view that has the command. | To control access to a command, you must specify the command immediately behind the view to which the command is assigned. The rules that control command access for any subview do not apply to the command.<br><br>For example, the "rule 1 deny command system ; interface * ; *" command string disables access to any command that is assigned to interface view. However, you can still execute the **acl number** command in interface view, because this command is assigned to system view rather than interface view. To disable access to this command, use "rule 1 deny command system ; acl *;". |
| Do not include the vertical bar (|), greater-than sign (>), or double greater-than sign (>>) when you specify **display** commands in a user role command rule. | The system does not treat the redirect signs and the parameters that follow the signs as part of command lines. However, in user role command rules, these redirect signs and parameters are handled as part of command lines. As a result, no rule that includes any of these signs can find a match.<br><br>For example, "rule 1 permit command display debugging > log" can never find a match. This is because the system has a **display debugging** command but not a **display debugging > log** command. |

## Examples

\# Permit the user role **role1** to execute the **display acl** command.

```
<Sysname> system-view
[Sysname] role name role1
[Sysname-role-role1] rule 1 permit command display acl
```

\# Permit the user role **role1** to execute all commands that start with **display**.

```
[Sysname-role-role1] rule 2 permit command display *
```

\# Permit the user role **role1** to execute the **radius scheme aaa** command in system view and use all commands assigned to RADIUS scheme view.

```
[Sysname-role-role1] rule 3 permit command system ; radius scheme aaa
```

\# Deny the access of **role1** to any read or write command of any feature.

```
[Sysname-role-role1] rule 4 deny read write feature
```

\# Deny the access of **role1** to any read command of the feature **aaa**.

```
[Sysname-role-role1] rule 5 deny read feature aaa
```

\# Permit **role1** to access all read, write, and execute commands of the feature group **1**.

```
[Sysname-role-role1] rule 6 permit read write execute feature-group 1
```

## Related commands

- **display role**
- **display role feature**
- **display role feature-group**
- **role**

# super

Use **super** to obtain another user role without reconnecting to the device.

**Syntax**

**super** [ *rolename* ]

**Views**

User view

**Predefined user roles**

network-admin

**Parameters**

*rolename*: Specifies a user role, a case-sensitive string of 1 to 63 characters. The user role must exist in the system. If you do not specify a user role, you obtain the network-admin user role.

**Usage guidelines**

The obtained user role is a temporary user role, because this command is effective only on the current login. The next time you are logged in with the user account, the original user role settings take effect.

To enable a user to obtain another user role without reconnecting to the device, you must configure user role authentication.

- If no local password is configured in the local password authentication (**local**), a console or AUX user can obtain the user role by either entering a string or not entering anything.
- If no local password is configured in the local-then-remote authentication (**local scheme**):
  o A console, TTY, or VTY user performs remote authentication.
  o An AUX user can obtain user role authorization by either entering a string or not entering anything.

**Examples**

\# Obtain the user role network-operator.

```
<Sysname> super network-operator
Password:
User privilege role is network-operator, and only those commands can be used that authorized
to the role.
```

**Related commands**

- **authentication super** (*Security Command Reference*)
- **super authentication-mode**
- **super password**

# super authentication-mode

Use **super authentication-mode** to set an authentication mode for temporary user role authorization.

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

**Syntax**

**super authentication-mode** { **local** | **scheme** } *

**undo super authentication-mode**

## Default

Local password authentication applies.

## Views

System view

## Predefined user roles

network-admin

## Parameters

**local**: Enables local password authentication.

**scheme**: Enables remote AAA authentication.

## Usage guidelines

The authentication setting applies only to AUX, VTY, and TTY users. A console user can obtain the user role without authentication.

For local password authentication, use the **super password** command to set a password.

For remote AAA authentication, set the username and password on the RADIUS or HWTACACS server.

If you specify both **local** and **scheme** keywords, the keyword first entered in the command takes precedence, as follows:

- **scheme local**—Enables remote-then-local authentication mode. The device first performs AAA authentication to obtain a temporary user role. If the remote HWTACACS or RADIUS server does not respond, or if the AAA configuration on the device is invalid, local password authentication is performed.
- **local scheme**—Enables local-then-remote authentication mode. The device first performs local password authentication. If no password is configured for the user role, the device performs remote authentication.

For more information about AAA, see *Security Configuration Guide*.

## Examples

# Enable local-only authentication for temporary user role authorization.
```
<Sysname> system-view
[Sysname] super authentication-mode local
```

# Enable remote-then-local authentication for temporary user role authorization.
```
<Sysname> system-view
[Sysname] super authentication-mode scheme local
```

## Related commands

- **authentication super** (*Security Command Reference*)
- **super password**

# super password

Use **super password** to set a password for a user role.

Use **undo super password** to restore the default.

## Syntax

In non-FIPS mode:

**super password** [ **role** *rolename* ] [ { **hash** | **simple** } *password* ]

**undo super password** [ **role** *rolename* ]

In FIPS mode:

**super password** [ **role** *rolename* ]

**undo super password** [ **role** *rolename* ]

## Default

No password is set for a user role.

## Views

System view

## Predefined user roles

network-admin

## Parameters

**role** *rolename*: Specifies a user role, a case-sensitive string of 1 to 63 characters. The user role must exist in the system. If you do not specify a user role, this command sets a password for the network-admin user role.

**hash**: Sets a hashed password.

**simple**: Sets a plaintext password. This password will be saved in hashed text for security purposes.

*password*: Specifies the password string. This argument is case sensitive.

- In non-FIPS mode:
  - o If **simple** is specified, the password must be a string of 1 to 63 characters.
  - o If **hash** is specified, the password must be a string of 1 to 110 characters.
- In FIPS mode, the password must be a string of 15 to 63 characters. The string must contain four character types including digits, uppercase letters, lowercase letters, and special characters.

## Usage guidelines

If you do not specify any parameters, you specify a plaintext password in the interactive mode.

The FIPS mode supports only the interactive mode for setting a password.

Set a password if you configure local password authentication for temporary user role authorization.

It is a good practice to specify different passwords for different user roles.

## Examples

# Set the password to **123456TESTplat&!** for the user role network-operator.

```
<Sysname> system-view
[Sysname] super password role network-operator simple 123456TESTplat&!
```

# Set the password to **123456TESTplat&!** in the interactive mode for the user role network-operator.

```
<Sysname> system-view
[Sysname] super password role network-operator
Password:
Confirm :
```

```
Updating user information. Please wait... ...
```

**Related commands**

**super authentication-mode**

# vlan policy deny

Use **vlan policy deny** to enter the user role VLAN policy view.

Use **undo vlan policy deny** to restore the default user role VLAN policy.

## Syntax

**vlan policy deny**

**undo vlan policy deny**

## Default

A user role does not have access to any VLAN.

## Views

User role view

## Predefined user roles

network-admin

## Usage guidelines

The **vlan policy deny** command denies the access of a user role to any VLAN.

To restrict the VLAN access of a user role to only a set of VLANs:

1.  Use **vlan policy deny** to deny access to any VLAN.

2.  Use **permit vlan** to specify accessible VLANs.

To configure a VLAN, make sure the VLAN is permitted by the user role VLAN policy in use. You can perform the following tasks on an accessible VLAN:

*   Create, remove, or configure a VLAN.

*   Enter the VLAN view.

*   Specify the VLAN in feature commands.

Any change to a user role VLAN policy takes effect only on users who log in with the user role after the change.

## Examples

# Deny the access of **role1** to any VLAN.

```
<Sysname> system-view
[Sysname] role name role1
[Sysname-role-role1] vlan policy deny
[Sysname-role-role1-vlanpolicy] quit
```

# Deny the access of **role1** to any VLAN except VLANs 50 to 100.

```
<Sysname> system-view
[Sysname] role name role1
[Sysname-role-role1] vlan policy deny
[Sysname-role-role1-vlanpolicy] permit vlan 50 to 100
```

## Related commands

- **display role**
- **permit vlan**
- **role**

# vpn-instance policy deny

Use **vpn-instance policy deny** to enter user role VPN instance policy view.

Use **undo vpn-instance policy deny** to restore the default user role VPN instance policy.

## Syntax

**vpn-instance policy deny**

**undo vpn-instance policy deny**

## Default

A user role has access to any VPN.

## Views

User role view

## Predefined user roles

network-admin

## Usage guidelines

The **vpn-instance policy deny** command denies the access of a user role to any VPN.

To restrict the VPN access of a user role to only a set of VPNs:

1.  Use **vpn-instance policy deny** to deny access to any VPN.
2.  Use **permit vpn-instance** to specify accessible VPNs.

To configure a VPN, make sure the VPN is permitted by the user role VPN instance policy in use. You can perform the following tasks on an accessible VPN:

- Create, remove, or configure the VPN.
- Enter the VPN instance view.
- Specify the VPN in feature commands.

Any change to a user role VPN instance policy takes effect only on users who log in with the user role after the change.

## Examples

# Deny the access of user role **role1** to any VPN.

```
<Sysname> system-view
[Sysname] role name role1
[Sysname-role-role1] vpn-instance policy deny
[Sysname-role-role1-vpnpolicy] quit
```

# Deny the access of user role **role1** to any VPN except **vpn2**.

```
<Sysname> system-view
[Sysname] role name role1
[Sysname-role-role1] vpn-instance policy deny
```

```
[Sysname-role-role1-vpnpolicy] permit vpn-instance vpn2
```

## Related commands

- **display role**

- **permit vpn-instance**

- **role**

# Login management commands

The device supports the FIPS mode that complies with NIST FIPS 140-2 requirements. Support for features, commands, and parameters might differ in FIPS mode and non-FIPS mode. For more information about FIPS mode, see *Security Configuration Guide*.

Some login management commands are available in both user line view and user line class view:

- A setting in user line view is applied only to the user line. A setting in user line class view is applied to all user lines of the class.
- A non-default setting in either view takes precedence over a default setting in the other view. A non-default setting in user line view takes precedence over a non-default setting in user line class view.
- A setting in user line view takes effect immediately and affects the online user. A setting in user line class view takes effect only for users who log in after the configuration is completed. It does not affect online users.

Some login management commands are not supported in some user line views but can be configured in the corresponding user line class views. However, the commands do not take effect. This chapter provides only remarks about commands that are not supported in user line view.

## activation-key

Use **activation-key** to define a shortcut key for starting a terminal session.

Use **undo activation-key** to restore the default.

### Syntax

**activation-key** *key-string*

**undo activation-key**

### Default

Pressing **Enter** starts a terminal session.

### Views

User line view, user line class view

### Predefined user roles

network-admin

### Parameters

*key-string*: Specifies the shortcut key. It can be a single character, a key sequence, or the ASCII code (in the range of 0 to 127) of the character or key sequence.

### Usage guidelines

This command is not supported in VTY line view or VTY line class view.

This command is available in both user line view and user line class view:

- If the setting in user line view is not the default, the setting in user line view takes effect.

- If the setting in user line view is the default but the setting in user line class view is not, the setting in user line class view takes effect.

To display the shortcut key you have defined, use the **display current-configuration | include activation-key** command.

### Examples

# Configure character **s** as the shortcut key for starting a terminal session on the console line.

```
<Sysname> system-view
[Sysname] line console 0
[Sysname-line-console0] activation-key s
```

To verify the configuration:

1. Exit the console session.
   ```
   [Sysname-line-console0] return
   <Sysname> quit
   ```

2. Log in again through the console line.

   The following message appears:
   ```
   Press ENTER to get started.
   ```

3. Press **Enter**.

   Pressing **Enter** does not start a session.

4. Enter **s**.

   A terminal session is started.
   ```
   <Sysname>
   ```

# authentication-mode

Use **authentication-mode** to set the authentication mode for a user line.

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

### Syntax

In non-FIPS mode:

**authentication-mode** { **none** | **password** | **scheme** }

**undo authentication-mode**

In FIPS mode:

**authentication-mode scheme**

**undo authentication-mode**

### Default

In non-FIPS mode, the authentication mode is **password** for VTY and AUX lines, and **none** for console and TTY lines.

In non-FIPS mode, the authentication mode is **none** for the AUX line.

In FIPS mode, the authentication mode is **scheme**.

### Views

User line view, user line class view

### Predefined user roles

network-admin

### Parameters

**none**: Disables authentication.

**password**: Performs local password authentication.

**scheme**: Performs AAA authentication. For more information about AAA, see *Security Configuration Guide.*

### Usage guidelines

When the authentication mode is **none**, any user can log in without authentication. To improve device security, use the password or scheme authentication mode.

In VTY line view, this command is associated with the **protocol inbound** command. If you specify a non-default value for only one of the two commands in VTY line view, the other command uses the default setting, regardless of the setting in VTY line class view.

### Examples

# Enable the **none** authentication mode for user line VTY 0.

```
<Sysname> system-view
[Sysname] line vty 0
[Sysname-line-vty0] authentication-mode none
```

# Enable password authentication for user line VTY 0 and set the password to **321**.

```
<Sysname> system-view
[Sysname] line vty 0
[Sysname-line-vty0] authentication-mode password
[Sysname-line-vty0] set authentication password simple 321
```

# Enable scheme authentication for user line VTY 0. Configure local user **123** and set the password to **321**. Assign the Telnet service and the user role network-admin to the user.

```
<Sysname> system-view
[Sysname] line vty 0
[Sysname-line-vty0] authentication-mode scheme
[Sysname-line-vty0] quit
[Sysname] local-user 123
[Sysname-luser-123] password simple 321
[Sysname-luser-123] service-type telnet
[Sysname-luser-123] authorization-attribute user-role network-admin
```

### Related commands

**set authentication password**

# auto-execute command

⚠ CAUTION:

After configuring this command for a user line, you might be unable to access the CLI through the user line. Make sure you can access the CLI through a different user line before you configure this command and save the configuration.

Use **auto-execute command** to specify a command that is automatically executed when a user logs in through the current user line.

Use **undo auto-execute command** to remove the configuration.

## Syntax

**auto-execute command** *command*

**undo auto-execute command**

## Default

Command auto-execution is disabled.

## Views

User line view, user line class view

## Predefined user roles

network-admin

## Parameters

*command*: Specifies the command to be automatically executed.

## Usage guidelines

This command is not supported in console line view or console line class view.

This command is not supported in AUX line view or AUX line class view.

This command is available in both user line view and user line class view:

- If the setting in user line view is not the default, the setting in user line view takes effect.
- If the setting in user line view is the default but the setting in user line class view is not, the setting in user line class view takes effect.

The device automatically executes the specified command when a user logs in through the user line, and closes the user connection after the command is executed. If the command triggers another task, the device does not close the user connection until the task is completed.

Typically, you configure the **auto-execute command telnet** *X.X.X.X* command on the device so the device redirects a Telnet user to the host at X.X.X.X. In this case, the connection to the current device is closed when the user terminates the Telnet connection to X.X.X.X.

## Examples

# Configure the device to automatically Telnet to 192.168.1.41 after a user logs in through user line VTY 0.

```
<Sysname> system-view
[Sysname] line vty 0
[Sysname-line-vty0] auto-execute command telnet 192.168.1.41
% This action will lead to configuration failure through line-vty0. Are you sure?
[Y/N]:y
[Sysname-line-vty0]
```

# To verify the configuration, Telnet to 192.168.1.40.

The device automatically Telnets to 192.168.1.41, and the following output is displayed:

```
C:\> telnet 192.168.1.40
****************************************************************************
* Copyright (c) 2004-2014 Hewlett-Packard Development Company, L.P.        *
```

```
* Without the owner's prior written consent,                              *
* no decompiling or reverse-engineering shall be allowed.                 *
****************************************************************************


<Sysname>
Trying 192.168.1.41 ...
Press CTRL+K to abort
Connected to 192.168.1.41 ...
****************************************************************************
* Copyright (c) 2004-2014 Hewlett-Packard Development Company, L.P.       *
* Without the owner's prior written consent,                              *
* no decompiling or reverse-engineering shall be allowed.                 *
****************************************************************************
<Sysname.41>
```

This operation is the same as directly logging in to the device at 192.168.1.41 through Telnet. When you break the Telnet connection to 192.168.1.41, the Telnet connection to 192.168.1.40 is broken at the same time.

# command accounting

Use **command accounting** to enable command accounting.

Use **undo command accounting** to restore the default.

## Syntax

**command accounting**

**undo command accounting**

## Default

Command accounting is disabled, and the accounting server does not record executed commands.

## Views

User line view, user line class view

## Predefined user roles

network-admin

## Usage guidelines

When command accounting is enabled but command authorization is not, every executed command is recorded on the HWTACACS server.

When both command accounting and command authorization are enabled, only authorized commands that are executed are recorded on the HWTACACS server.

Invalid commands issued by users are not recorded.

If the **command accounting** command is configured in user line class view:

- Command accounting is enabled on all user lines in the class.
- You cannot configure the **undo command accounting** command in the view of a user line in the class.

## Examples

# Enable command accounting for user line VTY 0.

```
<Sysname> system-view
[Sysname] line vty 0
[Sysname-line-vty0] command accounting
```

## Related commands

- **command authorization**
- **accounting command** (*Security Command Reference*)

# command authorization

Use **command authorization** to enable command authorization.

Use **undo command authorization** to restore the default.

## Syntax

**command authorization**

**undo command authorization**

## Default

Command authorization is disabled. Logged-in users can execute commands without authorization.

## Views

User line view, user line class view

## Predefined user roles

network-admin

## Usage guidelines

When command authorization is enabled, a command is available only if the following conditions are met:

- The user has the commensurate user role.
- The user is authorized to use the command by the AAA scheme.

If the **command authorization** command is configured in user line class view:

- Command authorization is enabled on all user lines in the class.
- You cannot configure the **undo command authorization** command in the view of a user line in the class.

## Examples

# Enable command accounting for VTY 0 so the VTY 0 user can execute only authorized commands that are permitted by the user role.

```
<Sysname> system-view
[Sysname] line vty 0
[Sysname-line-vty0] command authorization
```

## Related commands

- **command accounting**
- **authorization command** (*Security Command Reference*)

# databits

Use **databits** to specify the number of data bits for each character.

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

## Syntax

**databits** { **5** | **6** | **7** | **8** }

**undo databits**

## Default

Eight data bits are used for each character.

## Views

User line view

## Predefined user roles

network-admin

## Parameters

**5**: Uses five data bits for each character.

**6**: Uses six data bits for each character.

**7**: Uses seven data bits for each character.

**8**: Uses eight data bits for each character.

## Usage guidelines

This command is not supported in VTY line view.

This setting must be the same as that on the configuration terminal.

## Examples

# Configure AUX 0 to use five data bits for each character.
```
<Sysname> system-view
[Sysname] line aux 0
[Sysname-line-aux0] databits 5
```

# display line

Use **display line** to display user line information.

## Syntax

**display line** [ *number1* | { **aux** | **console** | **tty** | **vty** } *number2* ] [ **summary** ]

## Views

Any view

## Predefined user roles

network-admin

network-operator

## Parameters

*number1*: Specifies the absolute number of a user line.

The following matrix shows the value ranges for the *number1* argument:

| Hardware | Value range |
|---|---|
| MSR1000 | 0 to 144 |
| MSR2000 | • MSR2003: 0 to 144<br>• MSR2004-24/MSR2004-48: 0 to 240 |
| MSR3000 | 0 to 240 |
| MSR4000 | 0 to 501 |

**aux**: Specifies the AUX line.

**console**: Specifies the console line.

The following matrix shows the support of MSR routers for the **console** keyword:

| Hardware | Keyword compatibility |
|---|---|
| MSR1000 | No |
| MSR2000 | No |
| MSR3000 | No |
| MSR4000 | Yes |

**tty**: Specifies the TTY line.

**vty**: Specifies the VTY line.

*number2*: Specifies the relative number of a user line.

The following matrix shows the value ranges for the *number2* argument:

| Hardware | Value range |
|---|---|
| MSR1000 | **aux**: 0<br>**tty**: 1 to 80<br>**vty**: 0 to 63 |
| MSR2000 | • MSR2003:<br>**aux**: 0<br>**tty**: 1 to 80<br>**vty**: 0 to 63<br>• MSR2004-24/MSR2004-48:<br>**aux**: 0<br>**tty**: 1 to 176<br>**vty**: 0 to 63 |
| MSR3000 | **aux**: 0<br>**tty**: 1 to 176<br>**vty**: 0 to 63 |

| Hardware | Value range |
|----------|-------------|
| MSR4000 | **aux**: 0 to 2<br>**console**: 0 to 2<br>**tty**: 1 to 432<br>**vty**: 0 to 63 |

**summary**: Displays summary information about user lines. If you do not specify this keyword, the detailed information is displayed.

## Examples

# Display user line information.

```
<Sysname> display line 0
 Idx  Type     Tx/Rx      Modem Auth  Int       Location
 0    CON 0    9600        -    N     -         0/0

 +    : Line is active.
 F    : Line is active and in async mode.
 Idx  : Absolute index of line.
 Type : Type and relative index of line.
 Auth : Login authentication mode.
 Int  : Physical port of the line.
 A    : Authentication use AAA.
 N    : No authentication is required.
 P    : Password authentication.
```

### Table 4 Command output

| Field | Description |
|-------|-------------|
| Modem | Whether the modem allows calling in or out. By default, this attribute is not configured and a hyphen (-) is displayed. |
| Int | Physical port for the line. If there is no physical port for the line or the line is a console line, a hyphen (-) is displayed. |

# Display summary information about all user lines.

```
<Sysname> display line summary
 Line type : [CON]
         0:U
 Line type : [AUX]
         1:X
 Line type : [VTY]
         2:UXXX X
  2 lines used.      (U)
  5 lines not used.  (X)
```

Table 5 Command output

| Fields | Description |
|--------|-------------|
| *number*:*status* | The *number* indicates the absolute number of the first user line of the user line class, starting from 0. The *status* indicates whether the user lines of the user line class are being used (**X** for unused and **U** for used). |
| | For example, if "2:UXXX X" is displayed, there are five user lines of the user line class, which use the absolute numbers 2 through 6. User line 2 is in use, and the other user lines are not. |

# display telnet client

Use **display telnet client** to display the source address or interface for outgoing Telnet packets when the device acts as a Telnet client.

## Syntax

**display telnet client**

## Views

Any view

## Predefined user roles

network-admin

network-operator

## Examples

# Display the Telnet client configuration of the device when it serves as a Telnet client.

```
<Sysname> display telnet client
 The source IP address is 1.1.1.1.
```

The output shows that the device uses the source IPv4 address 1.1.1.1 for outgoing Telnet packets when it serves as a Telnet client.

## Related commands

**telnet client source**

# display user-interface

Use **display user-interface** to display user line information.

## Syntax

**display user-interface** [ *number1* | { **aux** | **console** | **tty** | **vty** } *number2* ] [ **summary** ]

## Views

Any view

## Predefined user roles

network-admin

network-operator

## Parameters

*number1*: Specifies the absolute number of a user line.

The following matrix shows the value ranges for the *number1* argument:

| Hardware | Value range |
|---|---|
| MSR1000 | 0 to 144 |
| MSR2000 | • MSR2003: 0 to 144<br>• MSR2004-24/MSR2004-48: 0 to 240 |
| MSR3000 | 0 to 240 |
| MSR4000 | 0 to 501 |

**aux**: Specifies the AUX line.

**console**: Specifies the console line.

The following matrix shows the support of MSR routers for the **console** keyword:

| Hardware | Keyword compatibility |
|---|---|
| MSR1000 | No |
| MSR2000 | No |
| MSR3000 | No |
| MSR4000 | Yes |

**tty**: Specifies the TTY line.

**vty**: Specifies the VTY line.

*number2*: Specifies the relative number of a user line.

The following matrix shows the value ranges for the *number2* argument:

| Hardware | Value range |
|---|---|
| MSR1000 | **aux**: 0<br>**tty**: 1 to 80<br>**vty**: 0 to 63 |
| MSR2000 | • MSR2003:<br>**aux**: 0<br>**tty**: 1 to 80<br>**vty**: 0 to 63<br>• MSR2004-24/MSR2004-48:<br>**aux**: 0<br>**tty**: 1 to 176<br>**vty**: 0 to 63 |
| MSR3000 | **aux**: 0<br>**tty**: 1 to 176<br>**vty**: 0 to 63 |

| Hardware | Value range |
|----------|-------------|
| MSR4000 | **aux**: 0 to 2<br>**console**: 0 to 2<br>**tty**: 1 to 432<br>**vty**: 0 to 63 |

**summary**: Displays summary information about user lines. If you do not specify this keyword, the detailed information is displayed.

## Usage guidelines

This command is an older version reserved for backward compatibility purposes. It has the same functionality and output as the **display line** command. HP recommends that you use the **display line** command.

## Examples

# Display user line information.

```
<Sysname> display user-interface 0
 Idx  Type     Tx/Rx      Modem Auth  Int        Location
 0    CON 0    9600        -    N     -          0/0
 +    : Line is active.
 F    : Line is active and in async mode.
 Idx  : Absolute index of line.
 Type : Type and relative index of line.
 Auth : Login authentication mode.
 Int  : Physical port of the line.
 A    : Authentication use AAA.
 N    : No authentication is required.
 P    : Password authentication.
```

**Table 6 Command output**

| Field | Description |
|-------|-------------|
| Modem | Whether the modem allows calling in or out. By default, this attribute is not configured and a hyphen (-) is displayed. |
| Int | Physical port for the line. If there is no physical port for the line or the line is a console line, a hyphen (-) is displayed. |

# Display summary information about all user lines.

```
<Sysname> display user-interface summary
 Line type : [CON]
         0:U
 Line type : [AUX]
         1:X
 Line type : [VTY]
         2:UXXX X
  2 lines used.     (U)
  5 lines not used.  (X)
```

| Fields | Description |
|---|---|
| *number:status* | The *number* indicates the absolute number of the first user line of the user line class, starting from 0. The *status* indicates whether the user lines of the user line class are being used (**X** for unused and **U** for used). |
| | For example, if "2:UXXX X" is displayed, there are five user lines of the user line class, which use the absolute numbers 2 through 6. User line 2 is in use, and the other user lines are not. |

# display users

Use **display users** to display online CLI user information.

## Syntax

**display users** [ **all** ]

## Views

Any view

## Predefined user roles

network-admin

network-operator

## Parameters

**all**: Displays all user lines supported by the device.

## Examples

# Display online user information.

```
<Sysname> display users
  Idx   Line    Idle       Time            Pid     Type
  10    VTY 0   00:10:49   Jun 11 11:27:32  320     TEL
+ 11    VTY 1   00:00:00   Jun 11 11:39:40  334     TEL
Following are more details.
VTY 0   :
        Location: 192.168.1.12
VTY 1   :
        Location: 192.168.1.26
 +    : Current operation user.
 F    : Current operation user works in async mode.
```

The output shows that two users have logged in to the device: one is using user line VTY 0 and the other (yourself) is using VTY 1. Your IP address is 192.168.1.26.

## Table 8 Command output

| Field | Description |
|---|---|
| Idx | Absolute number of the user line. |
| Line | Type and relative number of the user line. |

| Field | Description |
|-------|-------------|
| Idle | Time elapsed after the user's most recent input, in the format *hh*:*mm*:*ss*. |
| Time | Login time of the user. |
| Pid | Process ID of the user session. |
| Type | User type, such as Telnet, SSH, or PAD. |
| + | Indicates the user line you are using. |
| Location | IP address of the user. |

# escape-key

Use **escape-key** to define a shortcut key for terminating a task.

Use **undo escape-key** to disable the shortcut key for terminating a task.

## Syntax

**escape-key** { *key-string* | **default** }

**undo escape-key**

## Default

Pressing **Ctrl+C** terminates a task.

## Views

User line view, user line class view

## Predefined user roles

network-admin

## Parameters

*key-string*: Specifies the shortcut key. It can be a string of 1 to 3 characters, or an ASCII code value in the range of 0 to 127. If you enter a number that is greater than 127, or enter a string that is not a number, the first character is used as the shortcut key. For example, if you configure **escape-key 987**, the shortcut key is **9**. If you configure **escape-key abc**, the shortcut key is **a**.

**default**: Restores the default escape key sequence **Ctrl+C**.

## Usage guidelines

Some commands might take a long time to complete in some situations, for example:

- When the **ping** command has 1000 packets to send.
- When the **tracert** command is used for an unreachable destination.

Before such a command is completed, you can stop the command by pressing the shortcut key for terminating tasks.

Whether a command can be terminated by **Ctrl+C** by default depends on the software implementation of the command. For more information, see the description of the command.

HP recommends that you use a key sequence as the shortcut key. If you define a single character as the shortcut key, pressing the key while a command is being executed stops the command. If no command is being executed, the result depends on the following situations:

- If you are managing the local device, pressing the key enters the character as a common character.

- If you Telnet to another device and manage the remote device, pressing the key does not do anything.

You can execute this command multiple times, but only the most recent configuration takes effect. To view the current shortcut key definition, use the **display current-configuration** command.

This command is available in both user line view and user line class view:
- If the setting in user line view is not the default, the setting in user line view takes effect.
- If the setting in user line view is the default but the setting in user line class view is not, the setting in user line class view takes effect.

### Examples

# Define character **a** as the shortcut key for terminating a task.

```
<Sysname> system-view
[Sysname] line console 0
[Sysname-line-console0] escape-key a
```

To verify the configuration:

1. Ping IP address 192.168.1.49, specifying the **-c** keyword to set the number of ICMP echo request packets to 20.

```
<Sysname> ping -c 20 192.168.1.49
  PING 192.168.1.49: 56  data bytes, press a to break
    Reply from 192.168.1.49: bytes=56 Sequence=1 ttl=255 time=3 ms
    Reply from 192.168.1.49: bytes=56 Sequence=2 ttl=255 time=3 ms
```

2. Press **a**.

The task is terminated, and the system returns to user view.

```
--- 192.168.1.49 ping statistics ---
  2 packet(s) transmitted
  2 packet(s) received
  0.00% packet loss
  round-trip min/avg/max = 3/3/3 ms
<Sysname>
```

# flow-control

Use **flow-control** to configure the flow control mode.

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

### Syntax

**flow-control** { **hardware** | **none** | **software** }

**flow-control hardware** *direction1* [ **software** *direction2* ]

**flow-control software** *direction1* [ **hardware** *direction2* ]

**undo flow-control**

### Default

Flow control is disabled.

### Views

User line view

## Predefined user roles

network-admin

## Parameters

**hardware**: Performs hardware flow control.

**none**: Disables flow control.

**software**: Performs software flow control.

*direction1, direction2*: Specifies the flow control direction, **in** or **out**. If **in** is specified, the local device listens to flow control information from the remote device. If **out** is specified, the local device sends flow control information to the remote device.

## Usage guidelines

The device can perform flow control in either or both of the inbound and outbound directions.

You can specify only one flow control mode for one direction.

To specify the same flow control mode for the two directions, use the **flow-control** { **hardware** | **software** | **none** } command.

To specify different flow control modes for the two directions, use the **flow-control hardware** *direction1* [ **software** *direction2* ] or **flow-control software** *direction1* [ **hardware** *direction2* ] command. If you do not specify the **software** *direction2* or **hardware** *direction2* option, the flow control mode **none** applies to the direction represented by the option.

For two devices to communicate, make sure their flow control modes match.

## Examples

# Configure software flow control in the inbound and outbound directions for user line Console 0.

```
<Sysname> system-view
[Sysname] line console 0
[Sysname-line-console0] flow-control software
```

# Configure hardware flow control in the inbound direction and disable flow control in the outbound direction for user line Console 0. (On a device that supports the arguments of *direction1* and *direction2*.)

```
<Sysname> system-view
[Sysname] line console 0
[Sysname-line-console0] flow-control hardware in
```

# Configure hardware flow control in the inbound direction and software flow control in the outbound direction for user line Console 0. (On a device that supports the arguments of *direction1* and *direction2*.)

```
<Sysname> system-view
[Sysname] line console 0
[Sysname-line-console0] flow-control hardware in software out
```

# free line

Use **free line** to release a user line.

## Syntax

**free line** { *number1* | { **aux** | **console** | **tty** | **vty** } *number2* }

## Views

User view

## Predefined user roles

network-admin

## Parameters

*number1*: Specifies the absolute number of a user line.

The following matrix shows the value ranges for the *number1* argument:

| Hardware | Value range |
| --- | --- |
| MSR1000 | 0 to 144 |
| MSR2000 | • MSR2003: 0 to 144<br>• MSR2004-24/MSR2004-48: 0 to 240 |
| MSR3000 | 0 to 240 |
| MSR4000 | 0 to 501 |

**aux**: Specifies the AUX line.

**console**: Specifies the console line.

The following matrix shows the support of MSR routers for the **console** keyword:

| Hardware | Keyword compatibility |
| --- | --- |
| MSR1000 | No |
| MSR2000 | No |
| MSR3000 | No |
| MSR4000 | Yes |

**tty**: Specifies the TTY line.

**vty**: Specifies the VTY line.

*number2*: Specifies the relative number of a user line.

The following matrix shows the value ranges for the *number2* argument:

| Hardware | Value range |
| --- | --- |
| MSR1000 | **aux**: 0<br>**tty**: 1 to 80<br>**vty**: 0 to 63 |
| MSR2000 | • MSR2003:<br>**aux**: 0<br>**tty**: 1 to 80<br>**vty**: 0 to 63<br>• MSR2004-24/MSR2004-48:<br>**aux**: 0<br>**tty**: 1 to 176<br>**vty**: 0 to 63 |

| Hardware | Value range |
|----------|-------------|
| MSR3000 | **aux**: 0<br>**tty**: 1 to 176<br>**vty**: 0 to 63 |
| MSR4000 | **aux**: 0 to 2<br>**console**: 0 to 2<br>**tty**: 1 to 432<br>**vty**: 0 to 63 |

## Usage guidelines

This command does not release the line you are using.

## Examples

# Release user line VTY 1:

1.  Display online users.

    ```
    <Sysname> display users
      Idx  Line     Idle       Time             Pid    Type
      10   VTY 0    00:10:49   Jun 11 11:27:32  320    TEL
    + 11   VTY 1    00:00:00   Jun 11 11:39:40  334    TEL

    Following are more details.
    VTY 0   :
            Location: 192.168.1.12
    VTY 1   :
            Location: 192.168.1.26
     +    : Current operation user.
     F    : Current operation user works in async mode.
    ```

2.  If the operations of the user on VTY 1 impact your operations, log out the user.

    ```
    <Sysname> free line vty 1
    Are you sure to free line vty1? [Y/N]:y
     [OK]
    ```

# free user-interface

Use **free user-interface** to release a user line.

## Syntax

**free user-interface** { *number1* | { **aux** | **console** | **tty** | **vty** } *number2* }

## Views

User view

## Predefined user roles

network-admin

## Parameters

*number1*: Specifies the absolute number of a user line.

The following matrix shows the value ranges for the *number1* argument:

| Hardware | Value range |
|----------|-------------|
| MSR1000 | 0 to 144 |
| MSR2000 | • MSR2003: 0 to 144<br>• MSR2004-24/MSR2004-48: 0 to 240 |
| MSR3000 | 0 to 240 |
| MSR4000 | 0 to 501 |

**aux**: Specifies the AUX line.

**console**: Specifies the console line.

The following matrix shows the support of MSR routers for the **console** keyword:

| Hardware | Keyword compatibility |
|----------|----------------------|
| MSR1000 | No |
| MSR2000 | No |
| MSR3000 | No |
| MSR4000 | Yes |

**tty**: Specifies the TTY line.

**vty**: Specifies the VTY line.

*number2*: Specifies the relative number of a user line.

The following matrix shows the value ranges for the *number2* argument:

| Hardware | Value range |
|----------|-------------|
| MSR1000 | **aux**: 0<br>**tty**: 1 to 80<br>**vty**: 0 to 63 |
| MSR2000 | • MSR2003:<br>**aux**: 0<br>**tty**: 1 to 80<br>**vty**: 0 to 63<br>• MSR2004-24/MSR2004-48:<br>**aux**: 0<br>**tty**: 1 to 176<br>**vty**: 0 to 63 |
| MSR3000 | **aux**: 0<br>**tty**: 1 to 176<br>**vty**: 0 to 63 |

| Hardware | Value range |
|---|---|
| MSR4000 | **aux**: 0 to 2<br>**console**: 0 to 2<br>**tty**: 1 to 432<br>**vty**: 0 to 63 |

## Usage guidelines

This command does not release the line you are using.

This command is an older version reserved for backward compatibility purposes. It has the same functionality and output as the **free line** command. HP recommends you use the **free line** command.

## Examples

# Release user line VTY 1:

1. Display online users.

```
<Sysname> display users
  Idx  LINE     Idle       Time             Pid     Type
  10   VTY 0  00:10:49   Jun 11 11:27:32   320     TEL
+ 11   VTY 1  00:00:00   Jun 11 11:39:40   334     TEL
Following are more details.
VTY 0   :
        Location: 192.168.1.12
VTY 1   :
        Location: 192.168.1.26
 +     : Current operation user.
 F     : Current operation user works in async mode.
```

2. If the operations of the user on VTY 1 impact your operations, log out the user.

```
<Sysname> free user-interface vty 1
Are you sure to free line vty1? [Y/N]:y
 [OK]
```

# history-command max-size

Use **history-command max-size** to set the size of the command history buffer for a user line.

Use **undo history-command max-size** to restore the default.

## Syntax

**history-command max-size** *size-value*

**undo history-command max-size**

## Default

The buffer of a user line saves up to 10 history commands.

## Views

User line view, user line class view

## Predefined user roles

network-admin

## Parameters

*size-value*: Specifies the maximum number of history commands the buffer can store, in the range of 0 to 256.

## Usage guidelines

Each user line uses a separate command history buffer to save commands successfully executed by its user. The size of the buffer determines how many history commands the buffer can store.

To view stored history commands on your user line, press the up or down arrow key, or execute the **display history-command** command.

Terminating a CLI session clears the commands in the history buffer.

This command is available in both user line view and user line class view:

- If the setting in user line view is not the default, the setting in user line view takes effect.
- If the setting in user line view is the default but the setting in user line class view is not, the setting in user line class view takes effect.

## Examples

# Set the size of the command history buffer to 20 for user line Console 0.

```
<Sysname> system-view
[Sysname] line console 0
[Sysname-line-console0] history-command max-size 20
```

# idle-timeout

Use **idle-timeout** to set the session idle timeout.

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

## Syntax

**idle-timeout** *minutes* [ *seconds* ]

**undo idle-timeout**

## Default

The idle-timeout interval is 10 minutes.

## Views

User line view, user line class view

## Predefined user roles

network-admin

## Parameters

*minutes*: Specifies the number of minutes for the idle timeout, in the range of 0 to 35791. The default is 10 minutes.

*seconds*: Specifies the number of seconds for the idle timeout, in the range of 0 to 59. The default is 0 seconds.

## Usage guidelines

The system automatically terminates a user connection if no information interaction occurs on the connection within the idle-timeout interval.

Setting the idle timeout to 0 disables the idle timeout function.

This command is available in both user line view and user line class view:

- If the setting in user line view is not the default, the setting in user line view takes effect.
- If the setting in user line view is the default but the setting in user line class view is not, the setting in user line class view takes effect.

## Examples

# Set the idle timeout to 1 minute and 30 seconds for user line Console 0.

```
<Sysname> system-view
[Sysname] line console 0
[Sysname-line-console0] idle-timeout 1 30
```

# ip alias

Use **ip alias** to associate a Telnet redirect listening port with an IP address.

Use **undo ip alias** to restore the default.

## Syntax

**ip alias** *ip-address port-number*

**undo ip alias** *ip-address*

## Default

A Telnet redirect listening port is not associated with any IP address.

## Views

System view

## Predefined user roles

network-admin

## Parameters

*ip-address*: Specifies the IP address to be associated with the Telnet redirect listening port. The IP address cannot be the address of an interface on the device, but can belong to the same subnet.

*port-number*: Specifies a Telnet redirect listening port number in the range of 2000 to 50000.

## Usage guidelines

For a user to Telnet to a device through a Telnet redirect server, associate a Telnet redirect listening port with an IP address of the redirect server. Then, the user only needs to specify the IP address for the **telnet** command to Telnet to the destination device. If you do not configure the association, the user must specify both the IP address and the Telnet redirect listening port number.

## Examples

# Associate the Telnet redirect listening port 2000 with the IP address 1.1.1.1.

```
<Sysname> system-view
[Sysname] ip alias 1.1.1.1 2000
```

## Related commands

- **display tcp** (*Layer 3—IP Services Command Reference*)
- **redirect enable**

- **redirect listen-port**

# line

Use **line** to enter one or multiple user line views.

## Syntax

**line** { *first-number1* [ *last-number1* ] | { **aux** | **console** | **tty** | **vty** } *first-number2* [ *last-number2* ] }

## Views

System view

## Predefined user roles

network-admin

## Parameters

*first-number1*: Specifies the absolute number of the first user line.

*last-number1*: Specifies the absolute number of the last user line. This number cannot be smaller than *first-number1*.

The following matrix shows the value ranges for the *first-number1* and *last-number1* arguments:

| Hardware | Value range |
|---|---|
| MSR1000 | 0 to 144 |
| MSR2000 | <ul><li>MSR2003: 0 to 144</li><li>MSR2004-24/MSR2004-48: 0 to 240</li></ul> |
| MSR3000 | 0 to 240 |
| MSR4000 | 0 to 501 |

**aux**: Specifies the AUX line.

**console**: Specifies the console line.

The following matrix shows the support of MSR routers for the **console** keyword:

| Hardware | Keyword compatibility |
|---|---|
| MSR1000 | No |
| MSR2000 | No |
| MSR3000 | No |
| MSR4000 | Yes |

**tty**: Specifies the TTY line.

**vty**: Specifies the VTY line.

*first-number2*: Specifies the relative number of the first user line.

*last-number2*: Specifies the relative number of the last user line. This number cannot be smaller than *first-number2*.

The following matrix shows the value ranges for the *first-number2* and *last-number2* arguments:

| Hardware | Value range |
|---|---|
| MSR1000 | **aux**: 0<br>**tty**: 1 to 80<br>**vty**: 0 to 63 |
| MSR2000 | • MSR2003:<br>**aux**: 0<br>**tty**: 1 to 80<br>**vty**: 0 to 63<br>• MSR2004-24/MSR2004-48:<br>**aux**: 0<br>**tty**: 1 to 176<br>**vty**: 0 to 63 |
| MSR3000 | **aux**: 0<br>**tty**: 1 to 176<br>**vty**: 0 to 63 |
| MSR4000 | **aux**: 0 to 2<br>**console**: 0 to 2<br>**tty**: 1 to 432<br>**vty**: 0 to 63 |

## Usage guidelines

To configure settings for a single user line, use this command to enter the user line view.

To configure the same settings for multiple user lines, use this command to enter multiple user line views.

## Examples

# Enter the view of user line Console 0.

```
<Sysname> system-view
[Sysname] line console 0
[Sysname-line-console0]
```
# Enter the views of user lines VTY 0 to VTY 63.

```
<Sysname> system-view
[Sysname] line vty 0 63
[Sysname-line-vty0-63]
```

## Related commands

**line class**

# line class

Use **line class** to enter user line class view.

## Syntax

**line class** { **aux** | **console** | **tty** | **vty** }

## Views

System view

## Predefined user roles

network-admin

## Parameters

**aux**: Specifies the AUX line class view.

**console**: Specifies the console line class view.

**tty**: Specifies the TTY line class view.

**vty**: Specifies the VTY line class view.

The following matrix shows the keyword and router compatibility:

| Keyword | MSR1000 | MSR2000 | MSR3000 | MSR4000 |
|---------|---------|---------|---------|---------|
| **console** | No | No | No | Yes |

## Usage guidelines

To configure the same settings for all user lines of a line class, use this command to enter the user line class view.

Some login management commands are available in both user line view and user line class view:

- A setting in user line view is applied only to the user line. A setting in user line class view is applied to all user lines of the class.
- A non-default setting in either view takes precedence over a default setting in the other view. A non-default setting in user line view takes precedence over a non-default setting in user line class view.
- A setting in user line view takes effect immediately and affects the online user. A setting in user line class view takes effect only for users who log in after the configuration is completed. It does not affect online users.

In user line class view, you can execute the following commands:

- **activation-key**
- **auto-execute command**
- **authentication-mode**
- **command accounting**
- **command authorization**
- **escape-key**
- **history-command max-size**
- **idle-timeout**
- **protocol inbound**
- **screen-length**
- **set authentication password**
- **shell**
- **terminal type**

- **user-role**

## Examples

# Set the user connection timeout to 15 minutes in VTY line class view.

```
<Sysname> system-view
[Sysname] line class vty
[Sysname-line-class-vty] idle-timeout 15
```

# In console line class view, configure character **s** as the shortcut key for starting a terminal session.

```
<Sysname> system-view
[Sysname] line class console
[Sysname-line-class-console] activation-key s
[Sysname-line-class-console] quit
```

# In console line view, restore the default shortcut key for starting a terminal session.

```
[Sysname] line console 0
[Sysname-line-console0] undo activation-key
```

Alternatively:

```
[Sysname-line-console0] activation-key 13
```

To verify the configuration:

1. Exit the console session.
   ```
   [Sysname-line-console0] return
   <Sysname> quit
   ```
2. Log in again through the console line.
   The following message appears:
   ```
   Press ENTER to get started.
   ```
3. Press **Enter**.
   Pressing **Enter** does not start a session.
4. Enter **s**.
   A terminal session is started.
   ```
   <Sysname>
   ```

## Related commands

**line**

# lock

Use **lock** to lock the current user line. This method prevents unauthorized users from using the user line.

## Syntax

**lock**

## Default

By default, the system does not lock any user line.

## Views

User view

## Predefined user roles

network-admin

## Usage guidelines

This command is not supported in FIPS mode.

After executing the **lock** command, enter the password for unlocking the user line and confirm the password by entering it again.

To unlock the user line, press **Enter** and enter the correct password.

## Examples

# Lock the current user line and then unlock it.

```
<Sysname> lock
Please input password<1 to 16> to lock current line:
Password:
Again:
```

```
                    locked !
```

// The user line is locked. To unlock it, press **Enter** and enter the password:

```
Password:
<Sysname>
```

# parity

Use **parity** to specify a parity check mode.

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

## Syntax

**parity** { **even** | **mark** | **none** | **odd** | **space** }

**undo parity**

## Default

The setting is **none**, and no parity check is performed.

## Views

User line view

## Predefined user roles

network-admin

## Parameters

**even**: Performs even parity check.

**mark**: Performs mark parity check.

**none**: Disables parity check.

**odd**: Performs odd parity check.

**space**: Performs space parity check.

## Usage guidelines

This command is not supported in VTY line view.

The configuration terminal and the device must be configured with the same parity check mode to communicate.

## Examples

# Configure user line AUX 0 to perform odd parity check.

```
<Sysname> system-view
[Sysname] line aux 0
[Sysname-line-aux0] parity odd
```

# protocol inbound

Use **protocol inbound** to enable a user line to support Telnet, PAD, SSH, or all three protocols.

Use **undo protocol inbound** to restore the default.

## Syntax

In non-FIPS mode:

**protocol inbound** { **all** | **pad** | **ssh** | **telnet** }

**undo protocol inbound**

In FIPS mode:

**protocol inbound ssh**

**undo protocol inbound**

## Default

In non-FIPS mode, all three protocols are supported.

In FIPS mode, SSH is supported.

## Views

VTY line view, VTY line class view

## Predefined user roles

network-admin

## Parameters

**all**: Supports all three protocols.

**pad**: Supports PAD only.

**ssh**: Supports SSH only.

**telnet**: Supports Telnet only.

## Usage guidelines

This configuration is effective only for a user who logs in through the user line after the configuration is completed.

Before configuring a user line to support SSH, set the authentication mode to **scheme** for the user line. For more information, see **authentication-mode**.

In VTY line view, this command is associated with the **authentication-mode** command. If you specify a non-default value for only one of the two commands in VTY line view, the other command uses the default setting, regardless of the setting in VTY line class view.

## Examples

# Configure user lines VTY 0 through VTY 63 to support only SSH.

```
<Sysname> system-view
[Sysname] line vty 0 63
[Sysname-line-vty0-63] authentication-mode scheme
[Sysname-line-vty0-63] protocol inbound ssh
```

# Enable scheme authentication and SSH support in VTY line class view. Then, disable authentication for all VTY lines in VTY line view.

```
<Sysname> system-view
[Sysname] line class vty
[Sysname-line-class-vty] authentication-mode scheme
[Sysname-line-class-vty] protocol inbound ssh
[Sysname-line-class-vty] line vty 0 63
[Sysname-line-vty0-63] authentication-mode none
```

# redirect disconnect

Use **redirect disconnect** to manually terminate redirected Telnet connections.

## Syntax

**redirect disconnect**

## Views

AUX line view, TTY line view

## Predefined user roles

network-admin

## Examples

# Manually terminate the redirected Telnet connection on TTY line 1.

```
<Sysname> system-view
[Sysname] user-line tty 1
[Sysname-line-tty1] redirect disconnect
```

# redirect enable

Use **redirect enable** to enable Telnet redirect for a user line.

Use **undo redirect enable** to restore the default.

## Syntax

**redirect enable**

**undo redirect enable**

### Default

Telnet redirect is disabled for a user line.

### Views

AUX line view, TTY line view

### Predefined user roles

network-admin

### Usage guidelines

To allow users connected to the device (Device A) to Telnet to a second device (Device B) without knowing the IP address of Device B, do the following:

1. Connect Device A to Device B through its AUX port, asynchronous ports, or serial ports operating in asynchronous mode.
2. Configure Device A as a redirect server.
3. Specify the Telnet redirect listening port.

After the configuration is completed, users can Telnet to Device B by Telnetting to an IP address of Device A plus the redirect listening port number.

The user line must use the same transmission rate and number of stop bits as Device B.

Before setting the number of stop bits, use the **stopbit-error intolerance** command to verify the setting consistence.

### Examples

# Enable Telnet redirect for user line TTY 7.

```
<Sysname> system-view
[Sysname] line tty 7
[Sysname-line-tty7] redirect enable
```

### Related commands

- **display tcp** (*Layer 3—IP Services Command Reference*)
- **telnet**

# redirect listen-port

Use **redirect listen-port** to specify a Telnet redirect listening port.

Use **undo redirect listen-port** to restore the default listening port.

### Syntax

**redirect listen-port** *port-number*

**undo redirect listen-port**

### Default

The Telnet redirect listening port number is the absolute user line number plus 2000.

### Views

AUX line view, TTY line view

## Predefined user roles

network-admin

## Parameters

*port-number*: Specifies the number of the Telnet redirect listening port, in the range of 2000 to 50000.

## Usage guidelines

The device redirects only Telnet connection requests destined for the Telnet redirect listening port.

## Examples

# Set the Telnet redirect listening port number to 3000.

```
<Sysname> system-view
[Sysname] line tty 1
[Sysname-line-tty1] redirect listen-port 3000
```

## Related commands

- **display tcp** (*Layer 3—IP Services Command Reference*)
- **redirect enable**

# redirect passthrough

Use **redirect passthrough** to set the forwarding mode to passthrough for redirected Telnet packets.

Use **undo redirect passthrough** to restore the default.

## Syntax

**redirect passthrough**

**undo redirect passthrough**

## Default

A user line processes Telnet packets to be redirected as defined by the Telnet protocol.

## Views

AUX line view, TTY line view

## Predefined user roles

network-admin

## Usage guidelines

In passthrough mode, a line does not process Telnet packets to be redirected. It forwards the packets to the destination directly.

## Examples

# Set the Telnet packet forwarding mode to passthrough.

```
<Sysname> system-view
[Sysname] line tty 1
[Sysname-line-tty1] redirect passthrough
```

## Related commands

**redirect enable**

# redirect refuse-negotiation

Use **redirect refuse-negotiation** to disable Telnet option negotiation for Telnet redirect.

Use **undo redirect refuse-negotiation** to enable Telnet option negotiation for Telnet redirect.

### Syntax

**redirect refuse-negotiation**

**undo redirect refuse-negotiation**

### Default

Telnet option negotiation is enabled.

### Views

AUX line view, TTY line view

### Predefined user roles

network-admin

### Usage guidelines

When Telnet option negotiation is enabled, a Telnet option negotiation occurs during the Telnet connection establishment process.

### Examples

# Disable Telnet option negotiation for Telnet redirect on line TTY 1.

```
<Sysname> system-view
[Sysname] user-line tty 1
[Sysname-line-tty1] redirect refuse-negotiation
```

### Related commands

**redirect enable**

# redirect timeout

Use **redirect timeout** to set the idle timeout for the redirected Telnet connection.

Use **undo redirect timeout** to restore the default.

### Syntax

**redirect timeout** *time*

**undo redirect timeout**

### Default

The idle timeout is 360 seconds.

### Views

AUX line view, TTY line view

### Predefined user roles

network-admin

### Parameters

*time*: Specifies the idle timeout (in seconds) in the range of 30 to 86400. Setting it to 0 disables the timeout mechanism.

## Usage guidelines

If no data is received from a Telnet client before the timer expires, the user line terminates the redirected connection.

## Examples

# Set the idle timeout for the redirected Telnet connection to 200 seconds.

```
<Sysname> system-view
[Sysname] user-line tty 1
[Sysname-line-tty1] redirect timeout 200
```

## Related commands

**redirect enable**

# screen-length

Use **screen-length** to set the maximum number of lines to be displayed on a screen.

Use **undo screen-length** to restore the default.

## Syntax

**screen-length** *screen-length*

**undo screen-length**

## Default

Up to 24 lines are displayed on a screen.

## Views

User line view, user line class view

## Predefined user roles

network-admin

## Parameters

*screen-length*: Specifies the maximum number of lines to be displayed on a screen, in the range of 0 to 512. Setting this argument to 0 disables pausing between screens of output.

## Usage guidelines

This command sets the maximum number of lines that can be displayed on one screen when the screen pause function is enabled. If the screen pause function is disabled, the system displays command output without any pause.

The actual number of lines that can be displayed on a screen is restricted by the display specification of the configuration terminal. For example, if you set the maximum number of lines for a screen to 40, the device sends 40 lines to the screen at a time. If the display specification is 24 lines, only the last 24 lines are displayed on the screen. To view the previous 16 lines, you must press **PgUp**.

The screen pause function is enabled by default. To disable this function, execute the **screen-length 0** command or the **screen-length disable** command.

This command is available in both user line view and user line class view:

- If the setting in user line view is not the default, the setting in user line view takes effect.
- If the setting in user line view is the default but the setting in user line class view is not, the setting in user line class view takes effect.

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## Examples

# Set the maximum number of lines to be displayed on a screen to 30 for user line Console 0.

```
<Sysname> system-view
[Sysname] line console 0
[Sysname-line-console0] screen-length 30
```

## Related commands

**screen-length disable**

# send

Use **send** to send messages to user lines.

## Syntax

**send** { **all** | *number1* | { **aux** | **console** | **tty** | **vty** } *number2* }

## Views

User view

## Predefined user roles

network-admin

## Parameters

**all**: Specifies all user lines.

*number1*: Specifies the absolute number of a user line.

The following matrix shows the value ranges for the *number1* argument:

| Hardware | Value range |
|----------|-------------|
| MSR1000 | 0 to 144 |
| MSR2000 | • MSR2003: 0 to 144<br>• MSR2004-24/MSR2004-48: 0 to 240 |
| MSR3000 | 0 to 240 |
| MSR4000 | 0 to 501 |

**aux**: Specifies the AUX line.

**console**: Specifies the console line.

The following matrix shows the support of MSR routers for the **console** keyword:

| Hardware | Keyword compatibility |
|----------|----------------------|
| MSR1000 | No |
| MSR2000 | No |
| MSR3000 | No |
| MSR4000 | Yes |

**tty**: Specifies the TTY line.

**vty**: Specifies the VTY line.

*number2*: Specifies the relative number of a user line.

The following matrix shows the value ranges for the *number2* argument:

| Hardware | Value range |
|---|---|
| MSR1000 | **aux**: 0 <br> **tty**: 1 to 80 <br> **vty**: 0 to 63 |
| MSR2000 | • MSR2003: <br> **aux**: 0 <br> **tty**: 1 to 80 <br> **vty**: 0 to 63 <br> • MSR2004-24/MSR2004-48: <br> **aux**: 0 <br> **tty**: 1 to 176 <br> **vty**: 0 to 63 |
| MSR3000 | **aux**: 0 <br> **tty**: 1 to 176 <br> **vty**: 0 to 63 |
| MSR4000 | **aux**: 0 to 2 <br> **console**: 0 to 2 <br> **tty**: 1 to 432 <br> **vty**: 0 to 63 |

## Usage guidelines

To end a message, press **Enter**. To cancel a message and return to user view, press **Ctrl**+**C**.

## Examples

# Before you restart the device, send a notification to VTY 1 to inform the user.

```
<Sysname> send vty 1
Input message, end with Enter; abort with CTRL+C:
Your attention, please. I will reboot the system in 3 minutes.
Send message? [Y/N]:y
```

The message should appear on the screen of the user's configuration terminal, as shown in the following example:

```
[Sysname]

***
***
***Message from vty0 to vty1
***
Your attention, please. I will reboot the system in 3 minutes.
```

# set authentication password

Use **set authentication password** to set a password for local password authentication.

Use **undo set authentication password** to remove the password.

## Syntax

**set authentication password** { **hash** | **simple** } *password*

**undo set authentication password**

## Default

No password is set for local password authentication.

## Views

User line view, user line class view

## Predefined user roles

network-admin

## Parameters

**hash**: Sets a hashed password.

**simple**: Sets a plaintext password.

*password*: Specifies the password string. This argument is case sensitive. If **simple** is specified, it must be a string of 1 to 16 characters. If **hash** is specified, it must be a string of 1 to 110 characters.

## Usage guidelines

This command is not supported in FIPS mode.

For security purposes, the password is hashed before being saved, whether you specify the **hash** or **simple** keyword.

This command is available in both user line view and user line class view:

- If the setting in user line view is not the default, the setting in user line view takes effect.
- If the setting in user line view is the default but the setting in user line class view is not, the setting in user line class view takes effect.

## Examples

# Set the password for local password authentication on user line Console 0 to **hello**.

```
<Sysname> system-view
[Sysname] line console 0
[Sysname-line-console0] authentication-mode password
[Sysname-line-console0] set authentication password simple hello
```

When you log in again through user line Console 0, you must enter the password **hello** to pass authentication.

## Related commands

**authentication-mode**

# shell

Use **shell** to enable the terminal service for a user line.

Use **undo shell** to disable the terminal service for a user line.

### Syntax

**shell**

**undo shell**

### Default

The terminal service is enabled on all user lines.

### Views

User line view, user line class view

### Predefined user roles

network-admin

### Usage guidelines

The **undo shell** command is not supported in console line view or console line class view.

The **undo shell** command is not supported in AUX line view or AUX line class view.

You cannot disable the terminal service on the user line you are using.

When the device operates as a Telnet or SSH server, you cannot configure the **undo shell** command.

If the **undo shell** command is configured in user line class view, you cannot configure the **shell** command in the view of a user line in the class.

### Examples

# Disable the terminal service for user line VTY 0 through VTY 63 so no user can log in to the device through the user lines.

```
<Sysname> system-view
[Sysname] line vty 0 63
[Sysname-line-vty0-63] undo shell
Disable ui-vty0-63 , are you sure? [Y/N]:y
[Sysname-line-vty0-63]
```

# speed

Use **speed** to set the transmission rate (also called baud rate) on a user line.

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

### Syntax

**speed** *speed-value*

**undo speed**

### Default

The transmission rate is 9600 bps.

User line view

**Predefined user roles**

network-admin

**Parameters**

*speed-value*: Transmission rate in bps. Supported transmission rates vary by device model and configuration environment. The transmission rates for asynchronous serial interfaces might include:

- 300 bps.
- 600 bps.
- 1200 bps.
- 2400 bps.
- 4800 bps.
- 9600 bps.
- 19200 bps.
- 38400 bps.
- 57600 bps.
- 115200 bps.

**Usage guidelines**

This command is not supported in VTY line view.

The configuration terminal and the device must be configured with the same transmission rate to communicate.

**Examples**

# Set the transmission rate to 19200 bps for user line AUX 0.

```
<Sysname> system-view
[Sysname] line aux 0
[Sysname-line-aux0] speed 19200
```

# stopbit-error intolerance

Use **stopbit-error intolerance** to enable stop bits detection for a user line.

Use **undo stopbit-error intolerance** to restore the default.

**Syntax**

**stopbit-error intolerance**

**undo stopbit-error intolerance**

**Default**

Stop bits detection is disabled.

**Views**

User line view

### Predefined user roles

network-admin

### Usage guidelines

This command is not supported in VTY line view

### Examples

# Enable stop bits detection for user line AUX 0.

```
<Sysname> system-view
[Sysname] line aux 0
[Sysname-line-aux0] stopbit-error intolerance
```

# stopbits

Use **stopbits** to specify the number of stop bits for a character.

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

### Syntax

**stopbits** { **1** | **1.5** | **2** }

**undo stopbits**

### Default

One stop bit is used.

### Views

User line view

### Predefined user roles

network-admin

### Parameters

**1**: Uses one stop bit.

**1.5**: Uses one and a half stop bits. The device does not support using one and a half stop bits. If you specify this keyword, two stop bits are used.

**2**: Uses two stop bits.

### Usage guidelines

This command is not supported in VTY line view.

The configuration terminal and the device must be configured to use the same number of stop bits to communicate.

### Examples

# Set the number of stop bits to 1 for user line AUX 0.

```
<Sysname> system-view
[Sysname] line aux 0
[Sysname-line-aux0] stopbits 1
```

# telnet

Use **telnet** to Telnet to a host in an IPv4 network.

## Syntax

**telnet** *remote-host* [ *service-port* ] [ **vpn-instance** *vpn-instance-name* ] [ **source** { **interface** *interface-type interface-number* | **ip** *ip-address* } ] [ **dscp** *dscp-value* ]

## Views

User view

## Predefined user roles

network-admin

## Parameters

*remote-host*: Specifies the IPv4 address or host name of a remote host. A host name can be a case-insensitive string of 1 to 253 characters. Valid characters for a host name include letters, digits, hyphens (-), underscores (_), and dots (.).

*service-port*: Specifies the TCP port number for the Telnet service on the remote host. The value range is 0 to 65535 and the default is 23.

**vpn-instance** *vpn-instance-name*: Specifies the VPN instance to which the remote host belongs, where *vpn-instance-name* is a case-sensitive string of 1 to 31 characters. If the remote host belongs to the public network, do not specify this option.

**source**: Specifies a source IPv4 address or source interface for outgoing Telnet packets.

**interface** *interface-type interface-number*: Specifies the source interface. The primary IPv4 address of the interface will be used as the source IPv4 address for outgoing Telnet packets.

**ip** *ip-address*: Specifies the source IPv4 address for outgoing Telnet packets.

**dscp** *dscp-value*: Specifies the DSCP value for IP to use in outgoing Telnet packets to indicate the packet transmission priority. The value range is 0 to 63. The default is 48.

## Usage guidelines

This command is not supported in FIPS mode.

To terminate the current Telnet connection, press **Ctrl+K** or execute the **quit** command.

The source IPv4 address or source interface that is specified by this command is only applicable to the current Telnet connection.

## Examples

# Telnet to host 1.1.1.2, using 1.1.1.1 as the source IP address for outgoing Telnet packets.

```
<Sysname> telnet 1.1.1.2 source ip 1.1.1.1
```

## Related commands

**telnet client source**

# telnet client source

Use **telnet client source** to specify a source IPv4 address or source interface for outgoing Telnet packets when the device serves as a Telnet client.

Use **undo telnet client source** to remove the configuration.

## Syntax

**telnet client source** { **interface** *interface-type interface-number* | **ip** *ip-address* }

**undo telnet client source**

## Default

No source IPv4 address or source interface is specified for outgoing Telnet packets. The source IPv4 address is the primary IPv4 address of the outbound interface.

## Views

System view

## Predefined user roles

network-admin

## Parameters

**interface** *interface-type interface-number*: Specifies a source interface. The primary IPv4 address of the interface will be used as the source IPv4 address for outgoing Telnet packets.

**ip** *ip-address*: Specifies a source IPv4 address.

## Usage guidelines

This command is not supported in FIPS mode.

The source IPv4 address or source interface that is specified by this command applies to all Telnet connections. However, if a user specifies a source IPv4 address or source interface when executing the **telnet** command, the setting specified by the user takes effect.

## Examples

# Set the source IPv4 address for outgoing Telnet packets to 1.1.1.1 when the device serves as a Telnet client.

```
<Sysname> system-view
[Sysname] telnet client source ip 1.1.1.1
```

## Related commands

**display telnet client configuration**

# telnet ipv6

Use **telnet ipv6** to Telnet to a host in an IPv6 network.

## Syntax

**telnet ipv6** *remote-host* [ **-i** *interface-type interface-number* ] [ *port-number* ] [ **vpn-instance** *vpn-instance-name* ] [ **dscp** *dscp-value* ]

## Views

User view

## Predefined user roles

network-admin

## Parameters

*remote-host*: Specifies the IP address or host name of a remote host. A host name can be a case-insensitive string of 1 to 253 characters. Valid characters for a host name include letters, digits, hyphens (-), underscores (_), and dots (.).

**-i** *interface-type interface-number*: Specifies the outbound interface for sending Telnet packets. This option is required when the server address is a link-local address.

*port-number*: Specifies the TCP port number for the Telnet service on the remote host. The value range is 0 to 65535 and the default is 23.

**vpn-instance** *vpn-instance-name*: Specifies the VPN instance to which the remote host belongs, where *vpn-instance-name* is a case-sensitive string of 1 to 31 characters. If the remote host belongs to the public network, do not specify this option.

**dscp** *dscp-value*: Specifies the DSCP value for IPv6 to use in outgoing Telnet packets to indicate the packet transmission priority. The value range is 0 to 63. The default is 48.

## Usage guidelines

This command is not supported in FIPS mode.

To terminate the current Telnet connection, press **Ctrl+K** or execute the **quit** command.

## Examples

# Telnet to the host at 5000::1.
```
<Sysname> telnet ipv6 5000::1
```

# telnet server acl

Use **telnet server acl** to apply an ACL to filter Telnet logins.

Use **undo telnet server acl** to restore the default.

## Syntax

**telnet server acl** *acl-number*

**undo telnet server acl**

## Default

No ACL is used to filter Telnet logins.

## Views

System view

## Predefined user roles

network-admin

## Parameters

*acl-number*: Specifies an ACL by its number:
- **Basic ACL**—2000 to 2999.
- **Advanced ACL**—3000 to 3999.
- **Ethernet frame header ACL**—4000 to 4999.

## Usage guidelines

This command is not supported in FIPS mode.

Only one ACL can be used to filter Telnet logins, and only users permitted by the ACL can Telnet to the device.

This command does not take effect on existing Telnet connections.

You can specify an ACL that has not been created yet in this command. The command takes effect after the ACL is created.

For more information about ACL, see *ACL and QoS Configuration Guide*.

### Examples

# Permit only the user at 1.1.1.1 to Telnet to the device.
```
<Sysname> system-view
[Sysname] acl number 2001
[Sysname-acl-basic-2001] rule permit source 1.1.1.1 0
[Sysname-acl-basic-2001] quit
[Sysname] telnet server acl 2001
```

# telnet server dscp

Use **telnet server dscp** to set the DSCP value for IPv4 to use for outgoing Telnet packets on a Telnet server.

Use **undo telnet server dscp** to restore the default.

### Syntax

**telnet server dscp** *dscp-value*

**undo telnet server dscp**

### Default

IPv4 uses the DSCP value 48 for outgoing Telnet packets on a Telnet server.

### Views

System view

### Predefined user roles

network-admin

### Parameters

*dscp-value*: Specifies a DSCP value in the range of 0 to 63.

### Usage guidelines

This command is not supported in FIPS mode.

The DSCP value is carried in the ToS field of an IP packet, and it indicates the transmission priority of the packet.

### Examples

# Set the DSCP value for IPv4 to use for outgoing Telnet packets to 30 on a Telnet server.
```
<Sysname> system-view
[Sysname] telnet server dscp 30
```

# telnet server enable

Use **telnet server enable** to enable the Telnet server function.

Use **undo telnet server enable** to disable the Telnet server function.

## Syntax

**telnet server enable**

**undo telnet server enable**

## Default

The Telnet server function is disabled.

## Views

System view

## Predefined user roles

network-admin

## Usage guidelines

This command is not supported in FIPS mode.

Administrators can Telnet to the device only when the Telnet server function is enabled.

## Examples

# Enable the Telnet server function.
```
<Sysname> system-view
[Sysname] telnet server enable
```

# telnet server ipv6 acl

Use **telnet server ipv6 acl** to apply an IPv6 ACL to filter IPv6 Telnet logins.

Use **undo telnet server ipv6 acl** to restore the default.

## Syntax

**telnet server ipv6 acl** [ **ipv6** ] *acl-number*

**undo telnet server ipv6 acl**

## Default

No ACL is used to filter IPv6 Telnet logins.

## Views

System view

## Predefined user roles

network-admin

## Parameters

*acl-number*: Specifies an IPv6 ACL by its number:

- **Basic ACL**—2000 to 2999. The **ipv6** option is required.
- **Advanced ACL**—3000 to 3999. The **ipv6** option is required.

- **Ethernet frame header ACL**—4000 to 4999. Do not specify the **ipv6** option.

## Usage guidelines

This command is not supported in FIPS mode.

If the ACL does not exist or does not have a rule, all users are permitted to Telnet to the device.

When the ACL exists and has rules, only users permitted by the ACL can Telnet to the device.

This command is not effective for existing Telnet connections.

If you execute this command multiple times, the most recent configuration takes effect.

For more information about ACL, see *ACL and QoS Configuration Guide*.

## Examples

# Permit only the user at 2000::1 to Telnet to the device.

```
<Sysname> system-view
[Sysname] acl ipv6 number 2001
[Sysname-acl6-basic-2001] rule permit source 2000::1 128
[Sysname-acl6-basic-2001] quit
[Sysname] telnet server ipv6 acl ipv6 2001
```

# telnet server ipv6 dscp

Use **telnet server ipv6 dscp** to set the DSCP value for IPv6 to use for outgoing Telnet packets on a Telnet server.

Use **undo telnet server ipv6 dscp** to restore the default.

## Syntax

**telnet server ipv6 dscp** *dscp-value*

**undo telnet server ipv6 dscp**

## Default

IPv6 uses the DSCP value 48 for outgoing Telnet packets on a Telnet server.

## Views

System view

## Predefined user roles

network-admin

## Parameters

*dscp-value*: Specifies a DSCP value in the range of 0 to 63.

## Usage guidelines

This command is not supported in FIPS mode.

The DSCP value is carried in the Traffic class field of an IPv6 packet, and it indicates the transmission priority of the packet.

## Examples

# Set the DSCP value for IPv6 to use for outgoing Telnet packets to 30 on a Telnet server.

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

```
[Sysname] telnet server ipv6 dscp 30
```

# terminal type

Use **terminal type** to specify the terminal display type.

Use **undo terminal type** to restore the default.

## Syntax

**terminal type** { **ansi** | **vt100** }

**undo terminal type**

## Default

The terminal display type is ANSI.

## Views

User line view, user line class view

## Predefined user roles

network-admin

## Parameters

**ansi**: Specifies the terminal display type ANSI.

**vt100**: Specifies the terminal display type VT100.

## Usage guidelines

The device supports two terminal display types: ANSI and VT100. HP recommends that you set the display type to VT100 on both the device and the configuration terminal. If either side uses the ANSI type, a display problem such as cursor positioning error might occur when a command line has more than 80 characters.

## Examples

# Set the terminal display type to VT100.
```
<Sysname> system-view
[Sysname] line vty 0
[Sysname-line-vty0] terminal type vt100
```

# user-interface

Use **user-interface** to enter one or multiple user line views.

## Syntax

**user-interface** { *first-number1* [ *last-number1* ] | { **aux** | **console** | **tty** | **vty** } *first-number2* [ *last-number2* ] }

## Views

System view

## Predefined user roles

network-admin

## Parameters

*first-number1*: Specifies the absolute number of the first user line.

*last-number1*: Specifies the absolute number of the last user line. This number cannot be smaller than *first-number1*.

The following matrix shows the value ranges for the *first-number1* and *last-number1* arguments:

| Hardware | Value range |
|---|---|
| MSR1000 | 0 to 144 |
| MSR2000 | • MSR2003: 0 to 144<br>• MSR2004-24/MSR2004-48: 0 to 240 |
| MSR3000 | 0 to 240 |
| MSR4000 | 0 to 501 |

**aux**: Specifies the AUX line.

**console**: Specifies the console line.

The following matrix shows the support of MSR routers for the **console** keyword:

| Hardware | Keyword compatibility |
|---|---|
| MSR1000 | No |
| MSR2000 | No |
| MSR3000 | No |
| MSR4000 | Yes |

**tty**: Specifies the TTY line.

**vty**: Specifies the VTY line.

*first-number2*: Specifies the relative number of the first user line.

*last-number2*: Specifies the relative number of the last user line. This number cannot be smaller than *first-number2*.

The following matrix shows the value ranges for the *first-number2* and *last-number2* arguments:

| Hardware | Value range |
|---|---|
| MSR1000 | **aux**: 0<br>**tty**: 1 to 80<br>**vty**: 0 to 63 |

| Hardware | Value range |
|---|---|
| MSR2000 | • MSR2003:<br>**aux**: 0<br>**tty**: 1 to 80<br>**vty**: 0 to 63<br>• MSR2004-24/MSR2004-48:<br>**aux**: 0<br>**tty**: 1 to 176<br>**vty**: 0 to 63 |
| MSR3000 | **aux**: 0<br>**tty**: 1 to 176<br>**vty**: 0 to 63 |
| MSR4000 | **aux**: 0 to 2<br>**console**: 0 to 2<br>**tty**: 1 to 432<br>**vty**: 0 to 63 |

## Usage guidelines

To configure settings for a single user line, use this command to enter the user line view.

To configure the same settings for multiple user lines, use this command to enter multiple user line views.

This command is an older version reserved for backward compatibility purposes. It has the same functionality and output as the **line** command. HP recommends you use the **line** command.

## Examples

# Enter the view of user line Console 0.

```
<Sysname> system-view
[Sysname] user-interface console 0
[Sysname-line-console0]
```
# Enter the views of user lines VTY 0 to VTY 63.

```
<Sysname> system-view
[Sysname] user-interface vty 0 63
[Sysname-line-vty0-63]
```

## Related commands

**user-interface class**

# user-interface class

Use **user-interface class** to enter user line class view.

## Syntax

**user-interface class** { **aux** | **console** | **tty** | **vty** }

## Views

System view

### Predefined user roles

network-admin

### Parameters

**aux**: Specifies the AUX line class view.

**console**: Specifies the console line class view.

The following matrix shows the support of MSR routers for the **console** keyword:

| Hardware | Keyword compatibility |
|----------|----------------------|
| MSR1000 | No |
| MSR2000 | No |
| MSR3000 | No |
| MSR4000 | Yes |

**tty**: Specifies the TTY line class view.

**vty**: Specifies the VTY line class view.

### Usage guidelines

To configure the same settings for all user lines of a line class, use this command to enter the user line class view.

Some login management commands are available in both user line view and user line class view:

- A setting in user line view is applied only to the user line. A setting in user line class view is applied to all user lines of the class.
- A non-default setting in either view takes precedence over a default setting in the other view. A non-default setting in user line view takes precedence over a non-default setting in user line class view.
- A setting in user line view takes effect immediately and affects the online user. A setting in user line class view takes effect only for users who log in after the configuration is completed. It does not affect online users.

This command is an older version reserved for backward compatibility purposes. It has the same function and output as the **line class** command. HP recommends you use the **line class** command.

The following commands are available in user line class view:

- **activation-key**
- **auto-execute command**
- **authentication-mode**
- **command accounting**
- **command authorization**
- **escape-key**
- **history-command max-size**
- **idle-timeout**
- **protocol inbound**
- **screen-length**
- **set authentication password**

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- **shell**
- **terminal type**
- **user-role**

## Examples

\# Set the user connection timeout to 15 minutes in VTY line class view.
```
<Sysname> system-view
[Sysname] user-interface class vty
[Sysname-line-class-vty] idle-timeout 15
```

\# In console line class view, configure character **s** as the shortcut key for starting a terminal session.
```
<Sysname> system-view
[Sysname] line class console
[Sysname-line-class-console] activation-key s
[Sysname-line-class-console] quit
```

\# In console line view, restore the default shortcut key for starting a terminal session.
```
[Sysname] line console 0
[Sysname-line-console0] undo activation-key
```

Alternatively:
```
[Sysname-line-console0] activation-key 13
```

To verify the configuration:

1. Exit the console session.
   ```
   [Sysname-line-console0] return
   <Sysname> quit
   ```
2. Log in again through the console line.
   The following message appears:
   ```
   Press ENTER to get started.
   ```
3. Press **Enter**.
   Pressing **Enter** does not start a session.
4. Enter **s**.
   A terminal session is started.
   ```
   <Sysname>
   ```

## Related commands

**user-interface**

# user-role

Use **user-role** to assign a user role to a user line so users logged in through the user line get the user role at login.

Use **undo user-role** to remove a user role or restore the default.

## Syntax

**user-role** *role-name*

**undo user-role** [ *role-name* ]

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### Default

A console line user is assigned the user role network-admin. Users of other user lines are assigned the user role network-operator.

### Views

User line view, user line class view

### Predefined user roles

network-admin

### Parameters

*role-name*: Specifies a user role name, a case-sensitive string of 1 to 63 characters. The user role can be user-defined or predefined (network-admin, network-operator, or level-0 to level-15). If you do not specify this argument, the **undo user-role** command restores the default user role.

### Usage guidelines

This command is not supported in FIPS mode.

You can assign up to 64 user roles to a user line. A user logged in through the user line gets all the user roles.

For more information about user roles, see "Configuring RBAC."

### Examples

# Assign user role network-admin through the user line AUX 0.

```
<Sysname> system-view
[Sysname] line aux 0
[Sysname-line-aux0] user-role network-admin
```

# FTP commands

The device supports the FIPS mode that complies with NIST FIPS 140-2 requirements. Support for features, commands, and parameters might differ in FIPS mode and non-FIPS mode. For more information about FIPS mode, see *Security Configuration Guide*.

FTP is not supported in FIPS mode.

In this chapter, "MSR1000" refers to MSR1002-4. "MSR2000" refers to MSR2003, MSR2004-24, MSR2004-48. "MSR3000" collectively refers to MSR3012, MSR3024, MSR3044, MSR3064. "MSR4000" collectively refers to MSR4060 and MSR4080.

# FTP server commands

## display ftp-server

Use **display ftp-server** to display FTP server configuration and status information.

**Syntax**

**display ftp-server**

**Views**

Any view

**Predefined user roles**

network-admin

network-operator

**Examples**

# Display FTP server configuration and status information.

```
<Sysname> display ftp-server
FTP server is running.
User count:                      1
Idle-timeout timer (in minutes): 30
```

**Table 9 Command output**

| Field | Description |
| --- | --- |
| User count | Number of the current logged-in users. |
| Idle-timeout timer (in minutes) | If no packet is exchanged between the FTP server and client during this period, the FTP connection is broken. |

**Related commands**

- **ftp server enable**
- **ftp timeout**

# display ftp-user

Use **display ftp-user** to display detailed information about logged-in FTP users.

**Syntax**

**display ftp-user**

**Views**

Any view

**Predefined user roles**

network-admin

network-operator

**Examples**

\# Display detailed information about logged-in FTP users.

```
<Sysname> display ftp-user
UserName      HostIP           Port     HomeDir
root          192.168.20.184   46539    flash:
```

A field value is wrapped if its length exceeds the limit. The wrapped value is right justified.

The limits for fields are as follows:

- **UserName**—10 characters.
- **HostIP**—15 characters.
- **HomeDir**—37 characters.

```
<Sysname> display ftp-user
UserName      HostIP           Port     HomeDir
user2         2000:2000:2000:  1499     flash:/user2
              2000:2000:2000:
                   2000:2000
administra    100.100.100.100  10001    flash:/123456789/123456789/123456789/
     tor                                123456789/123456789/123456789/1234567
                                                  89/123456789
```

**Table 10 Command output**

| Field | Description |
| --- | --- |
| UserName | Name of the user. |
| HostIP | IP address of the user. |
| Port | Port number of the user. |
| HomeDir | Authorized directory for the user. |

# free ftp user

Use **free ftp user** to manually release the FTP connections established by using a specific user account.

## Syntax

**free ftp user** *username*

## Views

User view

## Predefined user roles

network-admin

## Parameters

*username*: Specifies a username. You can use the **display ftp-user** command to display FTP user information.

## Examples

# Release the FTP connections established by using the user account **ftpuser**.

```
<Sysname> free ftp user ftpuser
Are you sure to free FTP connection? [Y/N]:y
<Sysname>
```

# free ftp user-ip

Use **free ftp user-ip** to manually release the FTP connections established from a specific IPv4 address.

## Syntax

**free ftp user-ip** *ipv4-address* [ **port** *port* ]

## Views

User view

## Predefined user roles

network-admin

## Parameters

*ipv4-address*: Specifies the source IP address of an FTP connection. You can use the **display ftp-user** command to view the source IP addresses of FTP connections.

**port** *port*: Specifies the source port of an FTP connection. You can use the **display ftp-user** command to view the source ports of FTP connections.

## Examples

# Release the FTP connections established from IP address 192.168.20.184.

```
<Sysname> free ftp user-ip 192.168.20.184
Are you sure to free FTP connection? [Y/N]:y
<Sysname>
```

# free ftp user-ip ipv6

Use **free ftp user-ip ipv6 to** manually release the FTP connections established from a specific IPv6 address.

## Syntax

**free ftp user-ip ipv6** *ipv6-address* [ **port** *port* ]

## Views

User view

## Predefined user roles

network-admin

## Parameters

*ipv6-address*: Specifies the source IPv6 address of an FTP connection. You can use the **display ftp-user** command to view the source IPv6 addresses of FTP connections.

**port** *port*: Specifies the source port of an FTP connection. You can use the **display ftp-user** command to view the source ports of FTP connections.

## Examples

# Release the FTP connections established from IPv6 address 2000::154.

```
<Sysname> free ftp user-ip ipv6 2000::154
Are you sure to free FTP connection? [Y/N]:y
<Sysname>
```

# ftp server acl

Use **ftp server acl** to use an ACL to control FTP clients' access to the FTP server.

Use **undo ftp server acl** to restore the default.

## Syntax

**ftp server acl** { *acl-number* | **ipv6** *acl-number6* }

**undo ftp server acl** [ **ipv6** ]

## Default

No ACL is used to control FTP clients' access to the FTP server.

## Views

System view

## Predefined user roles

network-admin

## Parameters

*acl-number*: Specifies an IPv4 ACL number in the range of 2000 to 3999.

**ipv6** *acl-number6*: Specifies an IPv6 ACL number in the range of 2000 to 3999.

## Usage guidelines

You can use this command to permit only FTP requests from specific FTP clients. This configuration takes effect only for FTP connections to be established. It does not impact existing FTP connections. If you execute the command multiple times, the most recently specified ACL takes effect.

## Examples

# Use ACL 2001 to allow only client 1.1.1.1 to access the FTP server.

```
<Sysname> system-view
[Sysname] acl number 2001
[Sysname-acl-basic-2001] rule 0 permit source 1.1.1.1 0
[Sysname-acl-basic-2001] rule 1 deny source any
[Sysname-acl-basic-2001] quit
[Sysname] ftp server acl 2001
```

# ftp server dscp

Use **ftp server dscp** to set the DSCP value for IPv4 to use for outgoing FTP packets on an FTP server.

Use **undo ftp server dscp** to restore the default.

## Syntax

**ftp server dscp** *dscp-value*

**undo ftp server dscp**

## Default

IPv4 uses the DSCP value 0 for outgoing FTP packets on an FTP server.

## Views

System view

## Predefined user roles

network-admin

## Parameters

*dscp-value*: Specifies a DSCP value in the range of 0 to 63.

## Usage guidelines

The DSCP value is carried in the ToS field of an IP packet, and it indicates the transmission priority of the packet.

## Examples

# Set the DSCP value for IPv4 to use for outgoing FTP packets to 30 on an FTP server.
```
<Sysname> system-view
[Sysname] ftp server dscp 30
```

# ftp server enable

Use **ftp server enable** to enable the FTP server.

Use **undo ftp server enable** to disable the FTP server.

## Syntax

**ftp server enable**

**undo ftp server enable**

## Default

The FTP server is disabled.

**Views**

> System view

**Predefined user roles**

> network-admin

**Examples**

> # Enable the FTP server.
> ```
> <Sysname> system-view
> [Sysname] ftp server enable
> ```

# ftp server ipv6 dscp

> Use **ftp server ipv6 dscp** to set the DSCP value for IPv6 to use for outgoing FTP packets on an FTP server.
>
> Use **undo ftp server ipv6 dscp** to restore the default.

**Syntax**

> **ftp server ipv6 dscp** *dscp-value*
>
> **undo ftp server ipv6 dscp**

**Default**

> IPv6 uses the DSCP value 0 for outgoing FTP packets on an FTP server.

**Views**

> System view

**Predefined user roles**

> network-admin

**Parameters**

> *dscp-value*: Specifies a DSCP value in the range of 0 to 63.

**Usage guidelines**

> The DSCP value is carried in the Traffic class field of an IPv6 packet, and it indicates the transmission priority of the packet.

**Examples**

> # Set the DSCP value for IPv6 to use for outgoing FTP packets to 30 on an FTP server.
> ```
> <Sysname> system-view
> [Sysname] ftp server ipv6 dscp 30
> ```

# ftp server ssl-server-policy

> Use **ftp server ssl-server-policy** to associate an SSL server policy with the FTP server.
>
> Use **undo ftp server ssl-server-policy** to remove the association.

**Syntax**

> **ftp server ssl-server-policy** *policy-name*
>
> **undo ftp server ssl-server-policy**

## Default

No SSL server policy is associated with the FTP server.

## Views

System view

## Predefined user roles

network-admin

## Parameters

*policy-name*: Specifies an SSL server policy by its name, a string of 1 to 31 characters.

## Usage guidelines

After you associate an SSL server policy with the FTP server, a client that supports SFTP will establish a secure connection to the device to ensure data security.

## Examples

# Associate SSL server policy **myssl** with the FTP server.

```
<Sysname> system-view
[Sysname] ftp server ssl-server-policy myssl
```

## Related commands

- **ftp server enable**
- **ssl server-policy** (*Security Command Reference*)

# ftp timeout

Use **ftp timeout** to set the idle-timeout interval for FTP connections.

Use **undo ftp timeout** to restore the default.

## Syntax

**ftp timeout** *minute*

**undo ftp timeout**

## Default

The FTP idle-timeout interval is 30 minutes.

## Views

System view

## Predefined user roles

network-admin

## Parameters

*Minute*: Specifies an idle-timeout interval in the range of 1 to 35791 minutes.

## Usage guidelines

If no packet is exchanged on an FTP connection within the idle-timeout interval, the FTP server breaks the FTP connection to release resources.

# Set the idle-timeout interval to 36 minutes.
```
<Sysname> system-view
[Sysname] ftp timeout 36
```

# FTP client commands

Before executing FTP client configuration commands, make sure you have configured authorization settings for users on the FTP server. Authorized operations include viewing the files in the working directory, reading/downloading/uploading/renaming/removing files, and creating directories.

The FTP client commands in this section are supported by the device, but whether they can be executed successfully depends on the FTP server.

The output in the examples of this section varies by FTP server type.

## append

Use **append** to add the content of a file on the FTP client to a file on the FTP server.

### Syntax

**append** *localfile* [ *remotefile* ]

### Views

FTP client view

### Predefined user roles

network-admin

### Parameters

*localfile*: Specifies a local file on the FTP client.

*remotefile*: Specifies a remote file on the FTP server.

### Usage guidelines

You can perform this operation only after you log in to the FTP server.

### Examples

# Append the content of the local **a.txt** file to the **b.txt** file on the FTP server.
```
ftp> append a.txt b.txt
local: a.txt remote: b.txt
150 Connecting to port 50190
226 File successfully transferred
1657 bytes sent in 0.000736 seconds (2.15 Mbyte/s)
```

## ascii

Use **ascii** to set the file transfer mode to ASCII.

### Syntax

**ascii**

## Default

The file transfer mode is ASCII.

## Views

FTP client view

## Predefined user roles

network-admin

## Usage guidelines

You can perform this operation only after you log in to the FTP server.

The carriage return characters vary by operating system. For example, HP and Windows use **/r/n**, and Linux uses **/n**. To transfer files between two systems that use different carriage return characters, select the FTP transfer mode according to the file type.

FTP transfers files in either of the following modes:

- **Binary mode**—Transfers image files or pictures.
- **ASCII mode**—Transfers text files.

## Examples

# Set the file transfer mode to ASCII.

```
ftp> ascii
200 TYPE is now ASCII
```

## Related commands

**binary**

# binary

Use **binary** to set the file transfer mode to binary, which is also called the flow mode.

## Syntax

**binary**

## Default

The file transfer mode is ASCII.

## Views

FTP client view

## Predefined user roles

network-admin

## Usage guidelines

You can perform this operation only after you log in to the FTP server.

The carriage return characters vary by operating system. For example, HP and Windows use **/r/n**, and Linux uses **/n**. To transfer files between two systems that use different carriage return characters, determine FTP transfer mode according to the file type.

FTP transfers files in the following modes:

- **Binary mode**—Transfers program file or pictures.

- **ASCII mode**—Transfers text files.

## Examples

\# Set the file transfer mode to binary.
```
ftp> binary
200 TYPE is now 8-bit binary
```

## Related commands

**ascii**

# bye

Use **bye** to terminate the connection to the FTP server and return to user view.

If no connection is established between the device and the remote FTP server, use this command to return to user view.

## Syntax

**bye**

## Views

FTP client view

## Predefined user roles

network-admin

## Examples

\# Terminate the connection to the FTP server and return to user view.
```
ftp> bye
221-Goodbye. You uploaded 2 and downloaded 2 kbytes.
221 Logout.
<Sysname>
```

## Related commands

**quit**

# cd

Use **cd** to change the current working directory to another directory on the FTP server.

## Syntax

**cd** { *directory* | .. | / }

## Views

FTP client view

## Predefined user roles

network-admin

## Parameters

*directory*: Specifies the name of the target directory in the format [*drive*:][/]*path,* where *drive* represents the storage medium name, typically flash or cf. If the target directory does not exist, the **cd** command

does not change the current working directory. If no drive information is provided, the argument represents a folder or subfolder in the current directory. For more information about the *drive* and *path* arguments, see *Fundamentals Configuration Guide.*

**..**: Returns to the upper directory. Executing the **cd ..** command is the same as executing the **cdup** command. If the current working directory is the FTP root directory, the **cd ..** command does not change the current working directory.

**/**: Returns to the FTP root directory.

## Usage guidelines

You can perform this operation only after you log in to the FTP server.

The directory that can be accessed must be authorized by the FTP server.

## Examples

# Change the working directory to the subdirectory **logfile** of the current directory.

```
ftp> cd logfile
250 OK. Current directory is /logfile
```

# Change the working directory to the subdirectory **folder** of the FTP root directory.

```
ftp> cd /folder
250 OK. Current directory is /folder
```

# Change the working directory to the upper directory of the current directory.

```
ftp> cd ..
250 OK. Current directory is /
```

# Change the working directory to the FTP root directory.

```
ftp> cd /
250 OK. Current directory is /
```

## Related commands

- **cdup**
- **pwd**

# cdup

Use **cdup** to enter the upper directory of the FTP server.

This command does not change the working directory if the current directory is the FTP root directory.

## Syntax

**cdup**

## Views

FTP client view

## Predefined user roles

network-admin

## Usage guidelines

You can perform this operation only after you log in to the FTP server.

## Examples

# Change the working directory to the upper directory.

```
ftp> pwd
257 "/ftp/subdir" is your current location
ftp> cdup
250 OK. Current directory is /ftp
ftp> pwd
257 "/ftp" is your current location
```

## Related commands

- **cd**
- **pwd**

# close

Use **close** to terminate the connection to the FTP server without exiting FTP client view.

## Syntax

**close**

## Views

FTP client view

## Predefined user roles

network-admin

## Usage guidelines

You can perform this operation only after you log in to the FTP server.

## Examples

# Terminate the connection to the FTP server without exiting the FTP client view.

```
ftp> close
221-Goodbye. You uploaded 0 and downloaded 0 kbytes.
221 Logout.
ftp>
```

## Related commands

**disconnect**

# debug

Use **debug** to enable or disable FTP client debugging.

## Syntax

**debug**

## Default

FTP client debugging is disabled.

## Views

FTP client view

## Predefined user roles

network-admin

## Usage guidelines

When FTP client debugging is enabled, executing this command disables FTP client debugging.

When FTP client debugging is disabled, executing this command enables FTP client debugging.

## Examples

# Enable and then disable FTP client debugging.

```
ftp> debug
Debugging on (debug=1).
ftp> debug
Debugging off (debug=0).
```

# When the device serves as the FTP client, enable FTP client debugging and download file **a.txt** from the current directory of the FTP server.

```
ftp> debug
Debugging on (debug=1).
ftp> get a.txt
local: a.txt remote: a.txt
---> EPRT |2|8::124|50198|
200 PORT command successful
---> RETR a.txt
150 Connecting to port 50198
226 File successfully transferred
1569 bytes received in 0.0104 seconds (147.2 kbyte/s)
```

**Table 11 Command output**

| Field | Description |
|---|---|
| --> EPRT \|2\|8::124\|50198\| | FTP command.<br>• **2**—IPv6 (1 for IPv4).<br>• **8::124**—IPv6 address of the FTP server.<br>• **50198**—Port number of the FTP server. |
| 200 PORT command successful | Received FTP reply code. 200 represents the reply code, defined in RFC 959. |
| --> RETR a.txt | Downloads file **a.txt**. |

# delete

Use **delete** to permanently delete a file on the FTP server.

## Syntax

**delete** *remotefile*

## Views

FTP client view

## Predefined user roles

network-admin

## Parameters

*remotefile*: Specifies the name of a file on the FTP server.

## Usage guidelines

You can perform this operation only after you log in to the FTP server.

To perform this operation, you must have delete permission on the FTP server.

## Examples

# Delete file **b.txt**.

```
ftp> delete b.txt
250 Deleted b.txt
```

# dir

Use **dir** to display detailed information about the files and subdirectories in the current directory on the FTP server.

Use **dir** *remotefile* to display detailed information about a file or directory on the FTP server.

Use **dir** *remotefile localfile* to save detailed information about a file or directory on the FTP server to a local file.

## Syntax

**dir** [ *remotefile* [ *localfile* ] ]

## Views

FTP client view

## Predefined user roles

network-admin

## Parameters

*remotefile*: Specifies the name of a file or directory on the FTP server.

*localfile*: Specifies the name of the local file used for saving the displayed information.

## Usage guidelines

You can perform this operation only after you log in to the FTP server.

In FTP client view, executing the **dir** command is the same as executing the **ls** command.

## Examples

# Display detailed information about the files and subdirectories in the current directory on the FTP server.

```
ftp> dir
150 Connecting to port 50201
-rwxr-xr-x   1 0          0               1481 Jul  7 15:36 a.txt
```

```
-rwxr-xr-x    1 0          0                  0 Sep 27   2010 base.bin
drwxr-xr-x    2 0          0               8192 Jul  2 14:33 diagfile
drwxr-xr-x    3 0          0               8192 Jul  7 15:21 ftp
-rwxr-xr-x    1 0          0                  0 Sep 27   2010 kernel.bin
drwxr-xr-x    2 0          0               8192 Jul  5 09:15 logfile
drwxr-xr-x    2 0          0               8192 Jul  2 14:33 seclog
-rwxr-xr-x    1 0          0           40808448 Jul  2 14:33 simware-cmw710-sys
tem-a1801.bin
-rwxr-xr-x    1 0          0               3050 Jul  7 12:26 startup.cfg
-rwxr-xr-x    1 0          0              54674 Jul  4 09:24 startup.mdb
-rwxr-xr-x    1 0          0               1481 Jul  7 12:34 x.cfg
226 11 matches total
```

\# Save detailed information about file **a.txt** to **s.txt**.

```
ftp> dir a.txt s.txt
output to local-file: a.txt ? [Y/N]y
150 Connecting to port 50203
226-Glob: a.txt
```

\# Display the content of file **s.txt**.

```
ftp> bye
221-Goodbye. You uploaded 0 and downloaded 2 kbytes.
221 Logout.
<Sysname> more s.txt
-rwxr-xr-x    1 0          0               1481 Jul  7 12:34 a.txt
```

**Related commands**

> ls

# disconnect

Use **disconnect** to terminate the connection to the FTP server without exiting FTP client view.

**Syntax**

> **disconnect**

**Views**

> FTP client view

**Predefined user roles**

> network-admin

**Usage guidelines**

> You can perform this operation only after you log in to the FTP server.

**Examples**

\# Terminate the connection to the FTP server without exiting the FTP client view.

```
ftp> disconnect
221-Goodbye. You uploaded 0 and downloaded 0 kbytes.
221 Logout.
ftp>
```

## Related commands

**close**

# display ftp client source

Use **display ftp client source** to display the source address settings on the FTP client.

## Syntax

**display ftp client source**

## Views

Any view

## Predefined user roles

network-admin

network-operator

## Examples

# Display the source address settings on the FTP client.

```
<Sysname> display ftp client source
The source IP address of the FTP client is 1.1.1.1.
The source IPv6 address of the FTP client is 2001::1.
```

# ftp

Use **ftp** to log in to an FTP server and enter FTP client view.

## Syntax

**ftp** [ *ftp-server* [ *service-port* ] [ **vpn-instance** *vpn-instance-name* ] [ **dscp** *dscp-value* | **source** { **interface** *interface-type interface-number* | **ip** *source-ip-address* } ] ] *

## Views

User view

## Predefined user roles

network-admin

## Parameters

*ftp-server*: Specifies the IPv4 address or host name of an FTP server. A host name can be a case-insensitive string of 1 to 253 characters. Valid characters for a host name include letters, digits, hyphens (-), underscores (_), and dots (.).

*service-port*: Specifies the TCP port number of the FTP server, in the range of 0 to 65535. The default value is 21.

**vpn-instance** *vpn-instance-name*: Specifies the VPN instance to which the FTP server belongs. The *vpn-instance-name* argument is a case-sensitive string of 1 to 31 characters. If the FTP server belongs to the public network, do not specify this option.

**dscp** *dscp-value*: Specifies the DSCP value for IPv4 to use in outgoing FTP packets to indicate the packet transmission priority. The value range is 0 to 63. The default is 0.

**source** { **interface** *interface-type interface-number* | **ip** *source-ip-address* }: Specifies the source address used to establish the FTP connection.

- **interface** *interface-type interface-number*: Specifies an interface by its type and number. The primary IPv4 address of this interface will be used as the source address for outgoing FTP packets. If no primary IPv4 address is configured on the source interface, the connection cannot be established.

- **ip** *source-ip-address*: Specifies an IPv4 address. This address must have already been configured on the device.

## Usage guidelines

This command is only applicable to IPv4 networks.

If no parameters are specified, this command enters the FTP client view without logging in to the FTP server.

If the server parameters are specified, you are prompted to enter the username and password for logging in to the FTP server.

## Examples

# Log in to the FTP server 192.168.0.211, and specify the source IPv4 address for outgoing FTP packets as 192.168.0.212.

```
<Sysname>ftp 192.168.0.211 source ip 192.168.0.212
Press CTRL+C to abort.
Connected to 192.168.0.211 (192.168.0.211).
220 WFTPD 2.0 service (by Texas Imperial Software) ready for new user
User (192.168.0.211:(none)): abc
331 Give me your password, please
Password:
230 Logged in successfully
Remote system type is MSDOS.
ftp>
```

# ftp client source

Use **ftp client source** to specify the source IPv4 address for outgoing FTP packets.

Use **undo ftp client source** to restore the default.

## Syntax

**ftp client source** { **interface** *interface-type interface-number* | **ip** *source-ip-address* }

**undo ftp client source**

## Default

No source IPv4 address is configured for outgoing FTP packets. The device uses the primary IPv4 address of the output interface for the route to the server as the source IP address.

## Views

System view

## Predefined user roles

network-admin

## Parameters

**interface** *interface-type interface-number*: Specifies the source interface for establishing FTP connections. The primary IPv4 address of the source interface is used as the source IP address of packets sent to a FTP server. Make sure the interface is up and has the primary IPv4 address configured. Otherwise, the transmission fails.

**ip** *source-ip-address*: Specifies the source IP address for outgoing FTP packets. It must be the IPv4 address of an interface in up state. Otherwise, the transmission fails.

## Usages guidelines

If you execute this command multiple times, the most recent configuration takes effect.

The source address specified with the **ftp** command takes precedence over the source address specified with the **ftp client source** command.

The source address specified with the **ftp client source** command applies to all FTP connections. The source address specified with the **ftp** command applies only to the current FTP connection.

## Examples

# Specify the source IPv4 address for outgoing FTP packets as 192.168.20.222.

```
<Sysname> system-view
[Sysname] ftp client source ip 192.168.20.222
```

## Related commands

**ftp**

# ftp client ipv6 source

Use **ftp client ipv6 source** to specify the source address for FTP packets sent by the IPv6 FTP client.

Use **undo ftp client ipv6 source** to restore the default.

## Syntax

**ftp client ipv6 source** { **interface** *interface-type interface-number* | **ipv6** *source-ipv6-address* }

**undo ftp client ipv6 source**

## Default

No source address is configured. The device automatically selects a source IPv6 address as defined in RFC 3484.

## Views

System view

## Predefined user roles

network-admin

## Parameters

**interface** *interface-type interface-number*: Specifies the source interface by its type and number. The IPv6 address configured on the source interface is the source address of outgoing FTP packets. Make sure the interface is up. Otherwise, the transmission fails.

**ipv6** *source-ipv6-address*: Specifies the source IPv6 address for outgoing FTP packets. It must be the IPv6 address of an interface in up state. Otherwise, the transmission fails.

## Usages guidelines

If you execute this command multiple times, the most recent configuration takes effect.

The source address specified with the **ftp ipv6** command takes precedence over the source address specified with the **ftp client ipv6 source** command.

The source address specified with the **ftp client ipv6 source** command applies to all FTP connections. The source address specified with the **ftp ipv6** command applies only to the current FTP connection.

## Examples

# Specify source IPv6 address 2000::1 for outgoing FTP packets.

```
<Sysname> system-view
[Sysname] ftp client ipv6 source ipv6 2000::1
```

## Related commands

**ftp ipv6**

# ftp ipv6

Use **ftp ipv6** to log in to an FTP server and enter FTP client view.

## Syntax

**ftp ipv6** [ *ftp-server* [ *service-port* ] [ **vpn-instance** *vpn-instance-name* ] [ **dscp** *dscp-value* | **source** { **ipv6** *source-ipv6-address* | **interface** *interface-type interface-number* } ] * [ **-i** *interface-type interface-number* ] ]

## Views

User view

## Predefined user roles

network-admin

## Parameters

*ftp-server*: Specifies the IPv6 address or host name of an FTP server. A host name can be a case-insensitive string of 1 to 253 characters. Valid characters for a host name include letters, digits, hyphens (-), underscores (_), and dots (.).

*service-port*: Specifies the TCP port number of the FTP server, in the range of 0 to 65535. The default value is 21.

**dscp** *dscp-value*: Specifies the DSCP value for IPv6 to use in outgoing FTP packets to indicate the packet transmission priority. The value range is 0 to 63. The default is 0.

**source** { **ipv6** *source-ipv6-address* | **interface** *interface-type interface-number* }: Specifies the source address used to establish the FTP connection.

- **interface** *interface-type interface-number*: Specifies an interface by its type and number. This parameter can be used only when the FTP server address is a link local address and the specified output interface has a link local address. For more information about link local addresses, see *Layer 3—IP Services Configuration Guide*.

- **ipv6** *source-ipv6-address*: Specifies an IPv6 address. This address must be an address that has been configured on the device.

**vpn-instance** *vpn-instance-name*: Specifies the VPN instance to which the FTP server belongs. The *vpn-instance-name* argument is a case-sensitive string of 1 to 31 characters. If the FTP server belongs to the public network, do not specify this option.

**-i** *interface-type interface-number*: Specifies an output interface by its type and number. This parameter can be used only when the FTP server address is a link local address and the specified output interface has a link local address.

## Usage guidelines

This command is only applicable to IPv6 networks.

If no parameters are specified, this command enters the FTP client view.

If the FTP server parameters are specified, you are prompted to enter the username and password for logging in to the FTP server.

## Examples

\# Log in to the FTP server 2000::154.

```
<Sysname>ftp ipv6 2000::154
Press CTRL+C to abort.
Connected to 2000::154 (2000::154).
220 FTP service ready.
User (2000::154): root
331 Password required for root.
Password:
230 User logged in
Remote system type is HP
```

# get

Use **get** to download a file from the FTP server and save the file.

## Syntax

**get** *remotefile* [ *localfile* ]

## Views

FTP client view

## Predefined user roles

network-admin

## Parameters

*remotefile*: Specifies the name of the file to be downloaded.

*localfile*: Specifies a name for the downloaded file.

## Usage guidelines

You can perform this operation only after you log in to the FTP server.

To save the downloaded file to the working directory accessed by the **ftp** command, the *localfile* argument must specify a file name such as a.cfg. If you do not provide the *localfile* argument, the downloaded file uses its original name.

To save the downloaded file to some other directory, the *localfile* argument must specify the target directory plus the file name such as flash:/subdirectory/a.cfg. Otherwise, the command fails to take effect.

## Examples

# Download file **a.txt** and save it as **b.txt** in the working directory accessed by the **ftp** command.

```
ftp> get a.txt b.txt
local: b.txt remote: a.txt
150 Connecting to port 47457
226 File successfully transferred
1569 bytes received in 0.00527 seconds (290.6 kbyte/s)
```

# Download file **a.txt** to the folder **test** from the working directory accessed by the **ftp** command.

```
ftp> get a.txt flash:/test/b.txt
local: flash:/test/b.txt remote: a.txt
150 Connecting to port 47457
226 File successfully transferred
1569 bytes received in 0.00527 seconds (290.6 kbyte/s)
```

# On an MSR4000, download file **a.txt** to the root directory of the flash memory on the standby MPU (in slot 1). Save the file as **c.txt**.

```
ftp> get a.txt slot1#flash:/c.txt
local: slot1#flash:/c.txt remote: a.txt
150 Connecting to port 47460
226 File successfully transferred
1569 bytes received in 0.0564 seconds (27.2 kbyte/s)
```

## Related commands

**put**

# help

Use **help** to display all commands supported by an FTP client.

Use **help** *command-name* to display the help information of a command.

## Syntax

**help** [ *command-name* ]

## Views

FTP client view

## Predefined user roles

network-admin

## Parameters

*command-name*: Specifies a command supported by the FTP client.

## Usage guidelines

In FTP client view, executing the **help** command is the same as entering **?**.

## Examples

# Display all commands supported by the FTP client.

```
ftp> help
Commands may be abbreviated.  Commands are:

$               dir             mkdir           pwd             status
account         disconnect      mls             quit            struct
append          form            mode            quote           system
ascii           get             modtime         recv            sunique
bell            glob            mput            reget           tenex
binary          hash            newer           rstatus         trace
bye             help            nmap            rhelp           type
case            idle            nlist           rename          user
cd              image           ntrans          reset           umask
cdup            lcd             open            restart         verbose
chmod           ls              passive         rmdir           ?
close           macdef          prompt          runique
cr              mdelete         proxy           send
delete          mdir            sendport        site
debug           mget            put             size
```
# Display the help information for the **dir** command.
```
ftp> help dir
dir             list contents of remote directory
```

## Related commands

**?**

# lcd

Use **lcd** to display the local working directory of the FTP client.

Use **lcd** *directory* to change the local working directory of the FTP client to the specified directory.

Use **lcd /** to change the local working directory of the FTP client to the local root directory.

## Syntax

**lcd** [ *directory* | **/** ]

## Views

FTP client view

## Predefined user roles

network-admin

## Parameters

*directory*: Specifies a local directory of the FTP client. There must be a slash sign (/) before the name of the storage medium, for example, /flash:/logfile.

**/**: Specifies the root directory of the FTP client.

## Examples

# Display the local working directory.
```
ftp> lcd
```

111

```
Local directory now /flash:
```
# Change the local working directory to **flash:/logfile**.
```
ftp> lcd /flash:/logfile
Local directory now /flash:/logfile
```

# ls

Use **ls** to display detailed information about the files and subdirectories under the current directory on the FTP server.

Use **ls** *remotefile* to display detailed information about a file or directory on the FTP server.

Use **ls** *remotefile* *localfile* to save detailed information about a file or directory on the FTP server to a local file.

## Syntax

**ls** [ *remotefile* [ *localfile* ] ]

## Views

FTP client view

## Predefined user roles

network-admin

## Parameters

*remotefile*: Specifies the file name or directory on the FTP server.

*localfile*: Specifies the local file used to save the displayed information.

## Usage guidelines

You can perform this operation only after you log in to the FTP server.

In FTP client view, executing the **ls** command is the same as executing the **dir** command.

## Examples

# Display detailed information about the files and subdirectories under the current directory on the FTP server.
```
ftp> ls
150 Connecting to port 50201
-rwxr-xr-x   1 0         0               1481 Jul  7 15:36 a.txt
-rwxr-xr-x   1 0         0                  0 Sep 27  2010 base.bin
drwxr-xr-x   2 0         0               8192 Jul  2 14:33 diagfile
drwxr-xr-x   3 0         0               8192 Jul  7 15:21 ftp
-rwxr-xr-x   1 0         0                  0 Sep 27  2010 kernel.bin
drwxr-xr-x   2 0         0               8192 Jul  5 09:15 logfile
drwxr-xr-x   2 0         0               8192 Jul  2 14:33 seclog
-rwxr-xr-x   1 0         0           40808448 Jul  2 14:33 simware-cmw710-sys
tem-a1801.bin
-rwxr-xr-x   1 0         0               3050 Jul  7 12:26 startup.cfg
-rwxr-xr-x   1 0         0              54674 Jul  4 09:24 startup.mdb
-rwxr-xr-x   1 0         0               1481 Jul  7 12:34 x.cfg
226 11 matches total
```

# Save detailed information about file **a.txt** to **s.txt**.

```
ftp> ls a.txt s.txt
output to local-file: a.txt ? [Y/N]y
150 Connecting to port 50203
226-Glob: a.txt
```

# Display the content of file **s.txt**.

```
ftp> bye
221-Goodbye. You uploaded 0 and downloaded 2 kbytes.
221 Logout.
<Sysname> more s.txt
-rwxr-xr-x    1 0          0               1481 Jul  7 12:34 a.txt
```

## Related commands

**dir**

# mkdir

Use **mkdir** to create a subdirectory in the current directory on the FTP server.

## Syntax

**mkdir** *directory*

## Views

FTP client view

## Predefined user roles

network-admin

## Parameters

*directory*: Specifies the name of the directory to be created.

## Usage guidelines

You can perform this operation only after you log in to the FTP server.

You must have permission to perform this operation on the FTP server.

## Examples

# Create subdirectory **newdir** in the current directory of the remote FTP server.

```
ftp> mkdir newdir
257 "newdir" : The directory was successfully created
```

# newer

Use **newer** to update a local file by using a remote file on the FTP server.

## Syntax

**newer** *remotefile* [ *localfile* ]

## Views

FTP client view

### Predefined user roles

network-admin

### Parameters

*remotefile*: Specifies the name of the remote file on the FTP server.

*localfile*: Specifies the name of the local file to be updated.

### Usage guidelines

You can perform this operation only after you log in to the FTP server.

If the local file does not exist, this command downloads the file from the FTP server and saves it locally.

If the remote file on the FTP server is not newer than the local file, this command does not update the local file.

### Examples

# Update the local file with the file **a.txt** on the FTP server.

```
ftp> newer a.txt
local: a.txt remote: a.txt
150 Connecting to port 63513
226 File successfully transferred
1573 bytes received in 0.0293 seconds (52.3 kbyte/s)
```

# open

Use **open** to log in to the FTP server in FTP client view.

### Syntax

**open** *server-address* [ *service-port* ]

### Views

FTP client view

### Predefined user roles

network-admin

### Parameters

*server-address*: Specifies the IP address or host name of the FTP server.

*service-port*: Specifies the TCP port number of the FTP server, in the range of 0 to 65535. The default value is 21.

### Usage guidelines

After you issue this command, the system will prompt you to enter the username and password.

After you log in to one FTP server, you must disconnect from the server before you can use the **open** command to log in to another server.

### Examples

# In FTP client view, log in to the FTP server 192.168.40.7.

```
<Sysname>ftp
ftp> open 192.168.40.7
Press CTRL+C to abort.
```

```
Connected to 192.168.40.7 (192.168.40.7).
220 FTP service ready.
User (192.168.40.7:(none)): root
331 Password required for root.
Password:
230 User logged in.
Remote system type is HP.
ftp>
```

# passive

Use **passive** to set the FTP operation mode to **passive**.

## Syntax

**passive**

## Default

The FTP operation mode is **passive**.

## Views

FTP client view

## Predefined user roles

network-admin

## Usage guidelines

FTP can operate in either of the following modes:

- **Active mode**—The FTP server initiates the TCP connection.
- **Passive mode**—The FTP client initiates the TCP connection.

You can use this command multiple times to change between active and passive modes.

This command is mainly used together with a firewall to control FTP session establishment between private network users and public network users.

## Examples

# Set the FTP operation mode to **passive**.

```
ftp> passive
Passive mode on.
ftp> passive
Passive mode off.
```

# put

Use **put** to upload a file on the client to the remote FTP server.

## Syntax

**put** *localfile* [ *remotefile* ]

## Views

FTP client view

### Predefined user roles

network-admin

### Parameters

*localfile*: Specifies the name of the local file to be uploaded.

*remotefile*: Specifies the file name for saving the uploaded file on the FTP server.

### Usage guidelines

You can perform this operation only after you log in to the FTP server.

To upload a file in the working directory accessed by the **ftp** command, the *localfile* argument must specify a file name such as a.cfg.

To upload a file in some other directory, the *localfile* argument must specify the target directory plus the file name such as flash:/subdirectory/a.cfg. Otherwise, the command fails to take effect.

### Examples

# Upload the file **a.txt** in the working directory accessed by the **ftp** command. Save the file as **b.txt** on the FTP server.

```
ftp> put a.txt b.txt
local: a.txt remote: b.txt
150 Connecting to port 47461
226 File successfully transferred
1569 bytes sent in 0.000671 seconds (2.23 Mbyte/s)
```

# Upload the file **a.txt** in the folder **test** from the working directory accessed by the **ftp** command. Save the file as **b.txt** on the FTP server.

```
ftp> put flash:/test/a.txt b.txt
local: flash:/test/a.txt remote: b.txt
150 Connecting to port 47461
226 File successfully transferred
1569 bytes sent in 0.000671 seconds (2.23 Mbyte/s)
```

# On an MSR4000, upload the file **a.txt** in the root directory of the storage medium on the standby MPU (in slot 1). Save the file as **b.txt** on the FTP server.

```
ftp> put slot1#flash:/test/a.txt b.txt
local: slot1#flash:/test/a.txt remote: b.txt
150 Connecting to port 47461
226 File successfully transferred
1569 bytes sent in 0.000671 seconds (2.23 Mbyte/s)
```

### Related commands

**get**

# pwd

Use **pwd** to display the currently accessed directory on the FTP server.

### Syntax

**pwd**

## Views

FTP client view

## Predefined user roles

network-admin

## Usage guidelines

You can perform this operation only after you log in to the FTP server.

## Examples

\# Display the currently accessed directory on the remote FTP server.

```
ftp> cd subdir
250 OK. Current directory is /subdir
ftp> pwd
257 "/subdir" is your current location
```

# quit

Use **quit** to terminate the connection to the FTP server and return to user view.

## Syntax

**quit**

## Views

FTP client view

## Predefined user roles

network-admin

## Examples

\# Terminate the connection to the FTP server and return to user view

```
ftp> quit
221-Goodbye. You uploaded 0 and downloaded 0 kbytes.
221 Logout.
<Sysname>
```

## Related commands

**bye**

# reget

Use **reget** to get the missing part of a file from the FTP server.

## Syntax

**reget** *remotefile* [ *localfile* ]

## Views

FTP client view

## Predefined user roles

network-admin

network-operator

## Parameters

*remotefile*: Specifies the name of the file on the FTP server.

*localfile*: Specifies the name of the local file.

## Usage guidelines

You can perform this operation only after you log in to the FTP server.

If a file download is not completed due to network or storage space problems, use this command to get the part that has not been downloaded yet.

## Examples

# Get the part of the **s.bin** file that is missing due to transmission interruption.

```
ftp> reget s.bin
local: s.bin remote: s.bin
350 Restarting at 1749706
150-Connecting to port 47429
150 38143.3 kbytes to download
226 File successfully transferred
39058742 bytes received in 66.2 seconds (576.1 kbyte/s)
```

# rename

Use **rename** to rename a file.

## Syntax

**rename** [ *oldfilename* [ *newfilename* ] ]

## Views

FTP client view

## Predefined user roles

network-admin

## Parameters

*oldfilename*: Specifies the original file name.

*newfilename*: Specifies the new file name.

## Usage guidelines

You can perform this operation only after you log in to the FTP server.

## Examples

# Rename the file **a.txt** as **b.txt**.

- Method 1:

```
ftp> rename
(from-name) a.txt
(to-name) b.txt
350 RNFR accepted - file exists, ready for destination
250 File successfully renamed or moved
```

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- Method 2:

```
ftp> rename a.txt
(to-name) b.txt
350 RNFR accepted - file exists, ready for destination
250 File successfully renamed or moved
```

- Method 3:

```
ftp> rename a.txt b.txt
350 RNFR accepted - file exists, ready for destination
250 File successfully renamed or moved
```

# reset

Use **reset** to clear the reply information received from the FTP server in the buffer.

## Syntax

**reset**

## Views

FTP client view

## Predefined user roles

network-admin

## Examples

# Clear the reply information received from the FTP server.

```
ftp> reset
```

# restart

Use **restart** to specify the marker to retransmit a file.

## Syntax

**restart** *marker*

## Views

FTP client view

## Predefined user roles

network-admin

## Parameters

*marker*: Specifies the retransmit marker.

## Usage guidelines

You can perform this operation only after you log in to the FTP server.

Support for this command depends on the FTP server.

## Examples

# Retransmit the file **h.c** (82 bytes) from 2 bytes.

```
ftp> restart 2
```

```
restarting at 2. execute get, put or append to initiate transfer
ftp> put h.c h.c
local: h.c remote: h.c
350 Restart position accepted (2).
150 Ok to send data.
226 File receive OK.
80 bytes sent in 0.000445 seconds (175.6 kbyte/s)
ftp> dir
150 Here comes the directory listing.
-rw-r--r--    1 0        0               80 Jul 18 02:58 h.c
```

# rhelp

Use **rhelp** to display the FTP-related commands supported by the FTP server.

Use **rhelp** *protocol-command* to display the help information of an FTP-related command supported by the FTP server.

## Syntax

**rhelp** [ *protocol-command* ]

## Views

FTP client view

## Predefined user roles

network-admin

## Parameters

*protocol-command*: Specifies an FTP-related command.

## Usage guidelines

You can perform this operation only after you log in to the FTP server.

## Examples

# Display the FTP-related commands supported by the FTP.
```
ftp> rhelp
214-The following FTP commands are recognized
 USER PASS NOOP QUIT SYST TYPE
 HELP CWD  XCWD PWD  CDUP XCUP
 XPWD LIST NLST MLSD PORT EPRT
 PASV EPSV REST RETR STOR APPE
 DELE MKD  XMKD RMD  XRMD ABOR
 SIZE RNFR RNTO
4 UNIX Type: L8
```

**Table 12 Command output**

| Field | Description |
| --- | --- |
| USER | Username, corresponding to the xx command in FTP client view. |
| PASS | Password. |

| Field | Description |
|---|---|
| NOOP | Null operation. |
| SYST | System parameters. |
| TYPE | Request type. |
| CWD | Changes the current working directory. |
| XCWD | Extended command with the meaning of CWD. |
| PWD | Prints the working directory. |
| CDUP | Changes the directory to the upper directory. |
| XCUP | Extended command with the meaning of CDUP. |
| XPWD | Extended command with the meaning of PWD. |
| LIST | Lists files. |
| NLST | Lists brief file description. |
| MLSD | Lists file content. |
| PORT | Active mode (IPv4). |
| EPRT | Active mode (IPv6). |
| PASV | Passive mode (IPv4). |
| EPSV | Passive mode (IPv6). |
| REST | Restarts. |
| RETR | Downloads files. |
| STOR | Uploads files. |
| APPE | Appends uploading. |
| DELE | Deletes files. |
| MKD | Creates folders. |
| XMKD | Extended command with the meaning of MKD. |
| RMD | Removes folders. |
| XRMD | Extended command with the meaning of RMD. |
| ABOR | Aborts the transmission. |
| SIZE | Size of the transmission file. |
| RNFR | Original name. |
| RNTO | New name. |

# rmdir

Use **rmdir** to permanently delete a directory on the FTP server.

## Syntax

**rmdir** *directory*

### Views

FTP client view

### Predefined user roles

network-admin

### Parameters

*directory*: Specifies the name of a directory on the remote FTP server.

### Usage guidelines

You can perform this operation only after you log in to the FTP server.

To perform this operation, you must have delete permission on the FTP server.

Delete all files and subdirectories in a directory before you delete the directory. For more information about how to delete files, see the **delete** command.

Executing the **rmdir** command also deletes the files in the recycle bin of the specified directory.

### Examples

# Delete the empty directory **subdir1**.

```
ftp>rmdir subdir1
250 The directory was successfully removed
```

### Related commands

**delete**

# rstatus

Use **rstatus** to display FTP server status.

Use **rstatus** *remotefile* to display detailed information about a directory or file on the FTP server.

### Syntax

**rstatus** [ *remotefile* ]

### Views

FTP client view

### Predefined user roles

network-admin

### Parameters

*remotefile*: Specifies a directory or file on the FTP server.

### Usage guidelines

You can perform this operation only after you log in to the FTP server.

Support for this command depends on the FTP server.

### Examples

# Display FTP server status.

```
ftp> rstatus
211-FTP server status:
```

```
        Connected to 192.168.20.177
        Logged in as root
        TYPE: ASCII
        No session bandwidth limit
        Session timeout in seconds is 300
        Control connection is plain text
        Data connections will be plain text
        At session startup, client count was 1
        vsFTPd 2.0.6 - secure, fast, stable
211 End of status
```

**Table 13 Command output**

| Filed | Description |
|---|---|
| 211-FTP server status: | Beginning of the display of FTP server status, where 211 specifies the FTP command. |
| Connected to 192.168.20.177 | IP address of the FTP client. |
| Logged in as root | Login username root. |
| TYPE: ASCII | File transfer mode ASCII. |
| Session timeout in seconds is 300 | Timeout interval is 300 seconds. |
| Control connection is plain text | Control connection type is plain text. |
| Data connections will be plain text | Data connection type is plain text. |
| At session startup, client count was 1 | FTP connection number is 1. |
| vsFTPd 2.0.6 - secure, fast, stable | FTP version is 2.0.6. |
| 211 End of status | End of the display of FTP server status. |

# Display file **a.txt**.
```
ftp> rstatus a.txt
213-Status follows:
-rw-r--r--    1 0        0              80 Jul 18 02:58 a.txt
213 End of status
```

**Table 14 Command output**

| Field | Description |
|---|---|
| 213-Status follows: | Beginning of the display of the file, where 213 specifies the FTP command. |

| Field | Description |
|---|---|
| -rw-r–r-- | The first bit specifies the file type:<br>• **-**—Common.<br>• **B**—Block.<br>• **c**—Character.<br>• **d**—Directory.<br>• **l**—Symbol connection file.<br>• **p**—Pipe.<br>• **s**—socket.<br>The second bit through the tenth bit are divided into three groups. Each group contains three characters, representing the access permission of the owner, group, and other users.<br>• **-**—No permission.<br>• **r**—Read permission.<br>• **w**—Write permission.<br>• **x**—Execution permission. |
| 1 | Number of connections. |
| 0 | Name of the file owner. |
| 0 | Group number of the file owner. |
| 80 | File size, in bytes. |
| Jul 18 02:58 | Date and time when the file was most recently modified. |
| a.txt | File name. |
| 213 End of status | End of the display of the file information. |

# status

Use **status** to display FTP status.

## Syntax

**status**

## Views

FTP client view

## Predefined user roles

network-admin

## Examples

# Display FTP status.

```
ftp> status
Connected to 192.168.1.56.
No proxy connection.
Not using any security mechanism.
Mode: stream; Type: ascii; Form: non-print; Structure: file
Verbose: on; Bell: off; Prompting: on; Globbing: off
```

```
Store unique: off; Receive unique: off
Case: off; CR stripping: on
Ntrans: off
Nmap: off
Hash mark printing: off; Use of PORT cmds: on
```

**Table 15 Command output**

| Field | Description |
|---|---|
| Connected to 192.168.1.56. | IP address of the FTP server that is connected to the FTP client. |
| Verbose: on; Bell: off; Prompting: on; Globbing: off | Displays debugging information. |
| Store unique: off; Receive unique: off | The name of the file on the FTP server is unique and the name of the local file is unique. |
| Case: off; CR stripping: on | Does not support obtaining multiple files once and deletes "\r" when downloading text files. |
| Ntrans: off | Does not use the input-output transmission table. |
| Nmap: off | The file name does not use the input-to-output mapping template. |
| Hash mark printing: off; Use of PORT cmds: on | Does not end with a pound sign (#) and uses "PORT" data transmission. |

# system

Use **system** to display the system information of the FTP server.

## Syntax

**system**

## Views

FTP client view

## Predefined user roles

network-admin

## Usage guidelines

You can perform this operation only after you log in to the FTP server.

## Examples

# Display the system information of the FTP server.
```
ftp> system
5 UNIX Type: L8
```

# user

Use **user** to change to another user account after login.

## Syntax

**user** *username* [ *password* ]

## Views

FTP client view

## Predefined user roles

network-admin

## Parameters

*username*: Specifies the username of the target user account.

*password*: Specifies the password of the target user account.

## Usage guidelines

You can perform this operation only after you log in to the FTP server.

The username and password of the target user account must have already been configured. Otherwise, the user account change operation fails and the FTP connection is closed.

## Examples

# After logging in to the FTP server, use the username **ftp** and password **123456** to log in again to the FTP server. (The output might vary by FTP server.)

- Method 1:

```
ftp> user ftp 123456
331 Password required for ftp.
230 User logged in.
```

- Method 2:

```
ftp> user ftp
331 Password required for ftp.
Password:
230 User logged in.
```

# verbose

Use **verbose** to enable or disable the device to display detailed information about FTP operations.

## Syntax

**verbose**

## Default

The device displays detailed information about FTP operations.

## Views

FTP client view

## Predefined user roles

network-admin

## Usage guidelines

This command affects only the current FTP session.

## Examples

# Disable the device from displaying detailed information about FTP operations.

```
ftp> verbose
Verbose mode off.
```

# Execute the **get** command.

```
ftp> get a.cfg 1.cfg
```

# Enable the device to display detailed information about FTP operations.

```
ftp> verbose
Verbose mode on.
```

# Execute the **get** command.

```
ftp> get a.cfg 2.cfg
227 Entering Passive Mode (192,168,1,58,68,14)
150-Accepted data connection
150 The computer is your friend. Trust the computer
226 File successfully transferred
3796 bytes received in 0.00762 seconds (486.5 kbyte/s)
```

# ?

Use **?** to display all commands supported by an FTP client.

Use **?** *command-name* to display the help information for a command.

## Syntax

**?** [ *command-name* ]

## Views

FTP client view

## Predefined user roles

network-admin

## Parameters

*command-name*: Specifies a command supported by the FTP client.

## Usage guidelines

In FTP client view, entering **?** is the same as executing the **help** command.

## Examples

# Display all commands supported by the FTP client.

```
ftp> ?
Commands may be abbreviated.  Commands are:

$               dir            mkdir          pwd            status
account         disconnect     mls            quit           struct
append          form           mode           quote          system
ascii           get            modtime        recv           sunique
bell            glob           mput           reget          tenex
binary          hash           newer          rstatus        trace
```

127

```
bye              help             nmap             rhelp            type
case             idle             nlist            rename           user
cd               image            ntrans           reset            umask
cdup             lcd              open             restart          verbose
chmod            ls               passive          rmdir            ?
close            macdef           prompt           runique
cr               mdelete          proxy            send
delete           mdir             sendport         site
debug            mget             put              size
```

# Display the help information for the **dir** command.

```
ftp> ? dir
dir              list contents of remote directory
```

## Related commands

**help**

# TFTP commands

The device supports the FIPS mode that complies with NIST FIPS 140-2 requirements. Support for features, commands, and parameters might differ in FIPS mode and non-FIPS mode. For more information about FIPS mode, see *Security Configuration Guide*.

TFTP is not supported in FIPS mode.

## tftp

Use **tftp** to download a file from a TFTP server or upload a file to a TFTP server in an IPv4 network.

### Syntax

**tftp** *tftp-server* { **get** | **put** | **sget** } *source-filename* [ *destination-filename* ] [ **vpn-instance** *vpn-instance-name* ] [ **dscp** *dscp-value* | **source** { **interface** *interface-type interface-number* | **ip** *source-ip-address* } ] *

### Views

User view

### Predefined user roles

network-admin

### Parameters

*tftp-server*: Specifies the IPv4 address or host name of a TFTP server. The host name can be a case-insensitive string of 1 to 253 characters and can contain only letters, digits, hyphens (-), underscores (_), and dots (.).

**get**: Downloads a file and writes the file directly to the destination folder. If the destination folder already has a file with the same name, the system deletes the existing file before starting the download operation. The existing file is permanently deleted even if the download operation fails.

**put**: Uploads a file.

**sget**: Downloads a file and saves the file to memory before writing it to the destination folder. The system starts to write the file to the destination folder only after the file is downloaded and saved to memory successfully. If the destination folder already has a file with the same name, the system overwrites the existing file. If the download or save-to-memory operation fails, the existing file in the destination folder is not overwritten.

*source-filename*: Specifies the source file name, a case-insensitive string of 1 to 1 to 255 characters.

*destination-filename*: Specifies the destination file name, a case-insensitive string of 1 to 255 characters. If this argument is not specified, the file uses the source file name.

**vpn-instance** *vpn-instance-name*: Specifies the VPN instance to which the TFTP server belongs. The *vpn-instance-name* argument is a case-sensitive string of 1 to 31 characters. If the TFTP server belongs to the public network, do not specify this option.

**dscp** *dscp-value*: Specifies the DSCP value for IPv4 to use for outgoing TFTP packets to indicate the packet transmission priority. The value range is 0 to 63. The default is 0.

**source** { **interface** *interface-type interface-number* | **ip** *source-ip-address* }: Specifies the source address for outgoing TFTP packets. If this keyword is not specified, the device uses the primary IPv4 address of the route's output interface as the source address.

- **interface** *interface-type interface-number*: Specifies an interface by its type and number. The primary IPv4 address of this interface will be used as the source IPv4 address for outgoing TFTP packets. Make sure the interface is up and has the primary IPv4 address configured. Otherwise, the transmission fails.
- **ip** *source-ip-address*: Specifies an IPv4 address. This address must be the IPv4 address of an interface in up state. Otherwise, the transmission fails.

## Usages guidelines

The source address specified with the **tftp** command takes precedence over the source address specified with the **tftp client source** command.

The source address specified with the **tftp client source** command applies to all TFTP connections. The source address specified with the **tftp** command applies only to the current TFTP connection.

## Examples

# Download the **new.bin** file from the TFTP server at 192.168.1.1 and save it as **new.bin**.

```
<Sysname> tftp 192.168.1.1 get new.bin
Press CTRL+C to abort.
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100 13.9M  100 13.9M    0     0  1206k      0  0:00:11  0:00:11 --:--:-- 1206k
<System>
```

### Table 16 Command output

| Field | Description |
|---|---|
| % | Percentage of file transmission progress. |
| Total | Size of files to be transmitted, in bytes. |
| % | Percentage of received file size to total file size. |
| Received | Received file size, in bytes. |
| % | Percentage of sent file size to total file size. |
| Xferd | Sent file size, in bytes. |
| Average Dload | Average download speed, in bps. |
| Speed Upload | Average upload speed, in bps. |

## Related commands

**tftp client source**

# tftp client source

Use **tftp client source** to specify the source IPv4 address for TFTP packets sent by the TFTP client.

Use **undo tftp client source** to restore the default.

## Syntax

**tftp client source** { **interface** *interface-type interface-number* | **ip** *source-ip-address* }

**undo tftp client source**

## Default

No source IPv4 address is configured for outgoing TFTP packets. The device uses the primary IPv4 address of the output interface for the route to the server as the source IP address.

## Views

System view

## Predefined user roles

network-admin

## Parameters

**interface** *interface-type interface-number*: Specifies the source interface for establishing TFTP connections. The primary IPv4 address of the source interface is used as the source IPv4 address for packets sent to a TFTP server. Make sure the interface is up and has the primary IPv4 address configured. Otherwise, the transmission fails.

**ip** *source-ip-address*: Specifies the source IPv4 address for outgoing TFTP packets. It must be the IPv4 address of an interface in up state. Otherwise, the transmission fails.

## Usages guidelines

If you execute this command multiple times, the most recent configuration takes effect.

The source address specified with the **tftp** command takes precedence over the source address specified with the **tftp client source** command.

The source address specified with the **tftp client source** command applies to all TFTP connections. The source address specified with the **tftp** command applies only to the current TFTP connection.

## Examples

# Specify the source IP address of sent TFTP packets as 192.168.20.222.

```
<Sysname> system-view
[Sysname] tftp client source ip 192.168.20.222
```

## Related commands

**tftp**

# tftp ipv6

Use **tftp ipv6** to download a file from a TFTP server or upload a file to a TFTP server in an IPv6 network.

## Syntax

**tftp ipv6** *tftp-server* [ **-i** *interface-type interface-number* ] { **get** | **put** | **sget** } *source-filename* [ *destination-filename* ] [ **vpn-instance** *vpn-instance-name* ] [ **dscp** *dscp-value* | **source** { **interface** *interface-type interface-number* | **ipv6** *source-ipv6-address* } ] *

## Views

User view

## Predefined user roles

network-admin

## Parameters

*tftp-server*: Specifies the IPv6 address or host name of a TFTP server. The host name can be a case-insensitive string of 1 to 253 characters and can contain only letters, digits, hyphens (-), underscores (_), and dots (.).

**-i** *interface-type interface-number*: Specifies an output interface by its type and number. This parameter can be used only when the TFTP server address is a link local address and the specified output interface has a link local address. For link local address configuration, see *Layer 3—IP Services Configuration Guide*.

**get**: Downloads a file and writes the file directly to the destination folder. If the destination folder already has a file with the same name, the system deletes the existing file before starting the download operation. The existing file is permanently deleted even if the download operation fails.

**put**: Uploads a file.

**sget**: Downloads a file and saves the file to memory before writing it to the destination folder. The system starts to write the file to the destination folder only after the file is downloaded and saved to memory successfully. If the destination folder already has a file using the same name, the system overwrites the existing file. If the download or save-to-memory operation fails, the existing file in the destination folder is not overwritten.

*source-file*: Specifies the source file name, a case-insensitive string of 1 to 255 characters.

*destination-file*: Specifies the destination file name, a case-insensitive string of 1 to 255 characters. If this argument is not specified, the file uses the source file name.

**vpn-instance** *vpn-instance-name*: Specifies the VPN instance to which the TFTP server belongs. The *vpn-instance-name* argument is a case-sensitive string of 1 to 31 characters. If the TFTP server belongs to the public network, do not specify this option.

**dscp** *dscp-value*: Specifies the DSCP value for IPv6 to use in outgoing TFTP packets to indicate the packet transmission priority. The value range is 0 to 63. The default is 0.

**source** { **interface** *interface-type interface-number* | **ipv6** *source-ipv6-address* }: Specifies the source address for outgoing TFTP packets. If this keyword is not specified, the device uses the primary IPv6 address of the route's output interface as the source address.

- **interface** *interface-type interface-number*: Specifies an interface by its type and number. The primary IPv6 address of this interface will be used as the source IPv6 address for outgoing TFTP packets. Make sure the interface is up and has the primary IPv6 address configured. Otherwise, the transmission fails.

- **ipv6** *source-ipv6-address*: Specifies an IPv6 address. This address must be the IPv6 address of an interface in up state. Otherwise, the transmission fails.

**source** { **interface** *interface-type interface-number* | **ipv6** *source-ipv6-address* }: Specifies the source address for outgoing TFTP packets. If this keyword is not specified, the device automatically selects a source IPv6 address. For more information, see RFC 3484.

- **interface** *interface-type interface-number*: Specifies an interface by its type and number. The IPv6 address of this interface will be used as the source address for outgoing TFTP packets. Make sure the interface is up. Otherwise, the transmission fails.

- **ipv6** *source-ipv6-address*: Specifies an IPv6 address. This address must be the IPv6 address of an interface in up state. Otherwise, the transmission fails.

### Usages guidelines

The source address specified with the **tftp ipv6** command takes precedence over the source address specified with the **tftp client ipv6 source** command.

The source address specified with the **tftp client ipv6 source** command applies to all TFTP connections. The source address specified with the **tftp ipv6** command applies only to the current TFTP connection.

### Examples

# Download the **new.bin** file from the TFTP server at 2001::1 and save it as **new.bin**.

```
<Sysname> tftp ipv6 2001::1 get new.bin new.bin
Press CTRL+C to abort.
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100 13.9M  100 13.9M    0     0  1206k      0  0:00:11  0:00:11 --:--:-- 1206k
```

For more information about the command output, see Table 16.

# tftp client ipv6 source

Use **tftp client ipv6 source** to specify the source address for TFTP packets sent by the IPv6 TFTP client.

Use **undo tftp client ipv6 source** to restore the default.

### Syntax

**tftp client ipv6 source** { **interface** *interface-type interface-number* | **ipv6** *source-ipv6-address* }

**undo tftp client ipv6 source**

### Default

No source address is configured. The device automatically selects a source IPv6 address as defined in RFC 3484.

### Views

System view

### Predefined user roles

network-admin

### Parameters

**interface** *interface-type interface-number*: Specifies the source interface by its type and number. The IPv6 address configured on the source interface is the source address of outgoing TFTP packets. Make sure the interface is up. Otherwise, the transmission fails.

**ipv6** *source-ipv6-address*: Specifies the source IPv6 address of sent TFTP packets. It must be the IPv6 address of an interface in up state. Otherwise, the transmission fails.

### Usages guidelines

If you execute this command multiple times, the most recent configuration takes effect.

The source address specified with the **tftp ipv6** command takes precedence over the source address specified with the **tftp client ipv6 source** command.

The source address specified with the **tftp client ipv6 source** command applies to all TFTP connections. The source address specified with the **tftp ipv6** command applies only to the current TFTP connection.

## Examples

# Specify source IPv6 address 2000::1 for outgoing TFTP packets.
```
<Sysname> system-view
[Sysname] tftp client ipv6 source ipv6 2000::1
```

## Related commands

**tftp ipv6**

# tftp-server acl

Use **tftp-server acl** to use an ACL to control the device's access to TFTP servers in an IPv4 network.

Use **undo tftp-server acl** to restore the default.

## Syntax

**tftp-server acl** *acl-number*

**undo tftp-server acl**

## Default

No ACL is used to control the device's access to TFTP servers.

## Views

System view

## Predefined user roles

network-admin

## Parameters

*acl-number*: Specifies the number of a basic ACL, in the range of 2000 to 2999.

## Usages guidelines

You can use an ACL to deny or permit the device's access to specific TFTP servers.

## Examples

# Allow the device to access only the TFTP server at 1.1.1.1.
```
<Sysname> System-view
[Sysname] acl number 2000
[Sysname-acl-basic-2000] rule permit source 1.1.1.1 0
[Sysname-acl-basic-2000] quit
[Sysname] tftp-server acl 2000
```

# tftp-server ipv6 acl

Use **tftp-server ipv6 acl** to use an ACL to control the device's access to TFTP servers in an IPv6 network.

Use **undo tftp-server ipv6 acl** to restore the default.

## Syntax

**tftp-server ipv6 acl** *acl-number*

**undo tftp-server ipv6 acl**

## Default

No ACL is used to control the device's access to TFTP servers.

## Views

System view

## Predefined user roles

network-admin

## Parameters

*acl-number*: Specifies the number of a basic ACL, in the range of 2000 to 2999.

## Usages guidelines

You can use an ACL to deny or permit the device's access to specific TFTP servers.

## Examples

# Allow the device to access only the TFTP server at 2001::1.

```
<Sysname> System-view
[Sysname] acl ipv6 number 2001
[Sysname-acl6-basic-2001] rule permit source 2001::1/128
[Sysname-acl6-basic-2001] quit
[Sysname] tftp-server ipv6 acl 2001
```

# File system management commands

> **! IMPORTANT:**
> - Before managing storage media, files, and directories, make sure you know the possible impacts.
> - A file or directory whose name starts with a period (.) is considered a hidden file or directory. Do not give a common file or directory a name that starts with a period.
> - Some system files and directories are hidden.

A file name must be specified in one of the file name formats allowed. For more information, see *Fundamentals Configuration Guide*.

Before you use the **copy**, **delete**, **fixdisk**, **format**, **gunzip**, **gzip**, **mkdir**, **move**, **rename**, **rmdir**, or **undelete** command on a USB disk, make sure the disk is not write protected.

The device supports the FIPS mode that complies with NIST FIPS 140-2 requirements. Support for features, commands, and parameters might differ in FIPS mode and non-FIPS mode. For more information about FIPS mode, see *Security Configuration Guide*.

The following matrix shows the support of MSR routers for the flash memory and CF card:

| Hardware | Flash memory compatibility | CF card compatibility |
|---|---|---|
| MSR1000 | Yes | No |
| MSR2000 | Yes | No |
| MSR3000 | No | Yes |
| MSR4000 | No | Yes |

In this chapter, "MSR1000" refers to MSR1002-4. "MSR2000" refers to MSR2003, MSR2004-24, MSR2004-48. "MSR3000" collectively refers to MSR3012, MSR3024, MSR3044, MSR3064. "MSR4000" collectively refers to MSR4060 and MSR4080.

## cd

Use **cd** to change the current working directory.

### Syntax

**cd** { *directory* | **..** }

### Views

User view

### Predefined user roles

network-admin

### Parameters

*directory*: Specifies the destination directory in the format [*drive*:/]*path*. For more information about how to enter the drive and path arguments, see *Fundamentals Configuration Guide*. If no drive information is provided, the argument represents a folder or subfolder in the current directory.

**..**: Returns to an upper directory. If the current working directory is the root directory, an error message appears when you execute the **cd ..** command. No online help information is available for this keyword.

### Examples

# Access the **test** folder after logging in to the device.

```
<Sysname> cd test
```

# Return to the upper directory.

```
<Sysname> cd ..
```

# On an MSR4000, change to the **test** folder in the root directory of the active MPU:

1. Display the number of the slot where the standby MPU resides.

```
<Sysname> display device
Device Name: HP MSR4060

Slot No.       Board Type              Status        Primary       SubSlots
-------------------------------------------------------------------------------
0              MPU-100                 Normal        Master        0
1              MPU-100                 Normal        Standby       0
2              SPU-300                 Normal        N/A           8
```

The output shows that the slot number of the standby MPU is 1.

2. Access the root directory of the CF card on the standby MPU.

```
<Sysname> cd slot1#cfa0:/
```

3. Change to the **test** folder in the root directory of the active MPU.

```
<Sysname> cd cfa0:/test
```

# copy

Use **copy** to copy a file.

### Syntax

In non-FIPS mode:

**copy** *fileurl-source fileurl-dest* [ **vpn-instance** *vpn-instance-name* ] [ **source interface** *interface-type interface-number* ]

In FIPS mode:

**copy** *fileurl-source fileurl-dest*

### Views

User view

### Predefined user roles

network-admin

### Parameters

*fileurl-source*: Specifies the name or URL of the file to be copied in non-FIPS mode, and specifies the name of the file to be copied in FIPS mode. If the file resides on an FTP or TFTP server rather than on the device, specify the URL of the file. Whether a URL is case sensitive depends on the server.

*fileurl-dest*: Specifies the name or URL of the destination file or directory in non-FIPS mode, and specifies the name of the destination file or directory in FIPS mode. To copy the source file to an FTP or TFTP server,

specify a URL. If you specify a directory, the device copies the specified file to the directory and saves it with its original file name. Whether a URL is case sensitive depends on the server.

**vpn-instance** *vpn-instance-name*: Specifies the VPN instance to which the destination FTP or TFTP server belongs. The *vpn-instance-name* argument is a case-sensitive string of 1 to 31 characters. If the server belongs to the public network, do not specify this option.

**source interface** *interface-type interface-number*: Specifies the source interface used to connect to the server. After you specify the source interface, the device uses the primary IP address of the source interface as the source IP address for outgoing packets. If you do not specify this option, the device uses the outgoing interface as the source interface.

## Usage guidelines

In non-FIPS mode, you can use the **copy** command to perform the following tasks:

- Copy a local file and save it locally.
- Copy a local file and save it to an FTP or TFTP server.
- Copy a file on an FTP or TFTP server and save it locally.

To specify a file or directory, use the following guidelines:

| Location | Name format | Remarks |
|----------|-------------|---------|
| On the device | Use the file name guidelines in *Fundamentals Configuration Guide*. | N/A |
| On an FTP server | Enter the URL in the format ftp://*FTP username*[:*password*]@*server address*[:*port number*]/*file path*[/*file name*]. | The username and password must be the same as those configured on the FTP server. If the server authenticates users only by the username, you are not required to enter the password.<br><br>For example, to use the username 1 and password 1 and specify the startup.cfg file in the authorized working directory on FTP server 1.1.1.1, enter ftp://1:1@1.1.1.1/startup.cfg.<br><br>To specify an IPv6 address, enclose the IPv6 address in square brackets ([ ]), for example, ftp://test:test@[2001::1]:21/test.cfg. |
| On a TFTP server | Enter the URL in the format tftp://*server address*[:*port number*]/*file path*[/*file name*]. | For example, to specify the startup.cfg file in the working directory on TFTP server 1.1.1.1, enter the URL tftp://1.1.1.1/startup.cfg.<br><br>To enter an IPv6 address, enclose the IPv6 address in square brackets ([ ]), for example, ftp://test:test@[2001::1]:21/test.cfg. |

In FIPS mode, you can only use the **copy** command to copy a local file and save it locally.

## Examples

# Copy the **test.cfg** file in the current folder and save it to the current folder as **testbackup.cfg**.

```
<Sysname> copy test.cfg testbackup.cfg
Copy flash:/test.cfg to flash:/testbackup.cfg?[Y/N]:y
Copying file flash:/test.cfg to flash:/testbackup.cfg...Done.
```

# Copy the **1.cfg** file from the flash memory's **test** folder to the CF card. Save the copy to the **testbackup** folder in the root directory with the file name **1backup.cfg**.

```
<Sysname> copy flash:/test/1.cfg cfa0:/testbackup/1backup.cfg
```

```
Copy flash:/test/1.cfg to cfa0:/testbackup/1backup.cfg?[Y/N]:y
Copying file flash:/test/1.cfg to cfa0:/testbackup/1backup.cfg...Done.
```

# Copy **test.cfg** from the working directory on FTP server 1.1.1.1. Save the copy to the local current folder as **testbackup.cfg.** In this example, the FTP username and password are **user** and **private**.

```
<Sysname> copy ftp://user:private@1.1.1.1/test.cfg testbackup.cfg
Copy ftp://user:private@1.1.1.1/test.cfg to flash:/testbackup.cfg?[Y/N]:y
Copying file ftp://user:private@1.1.1.1/test.cfg to flash:/testbackup.cfg... Done.
```

# Copy **test.cfg** from the current folder. Save the copy to the working directory on FTP server 1.1.1.1 as **testbackup.cfg**. In this example, the FTP username and password are **user** and **private**.

```
<Sysname> copy test.cfg ftp://user:private@1.1.1.1/testbackup.cfg
Copy flash:/test.cfg to ftp://user:private@1.1.1.1/testbackup.cfg?[Y/N]:y
Copying file flash:/test.cfg to ftp://user:private@1.1.1.1/testbackup.cfg... Done.
```

# Copy **test.cfg** from the working directory on TFTP server 1.1.1.1. Save the copy to the local current folder as **testbackup.cfg**.

```
<Sysname> copy tftp://1.1.1.1/test.cfg testbackup.cfg
Copy tftp://1.1.1.1/test.cfg to flash:/testbackup.cfg?[Y/N]:y
Copying file tftp://1.1.1.1/test.cfg to flash:/testbackup.cfg... Done.
```

# Copy **test.cfg** from the current folder. Save the copy to the working directory on TFTP server 1.1.1.1 as **testbackup.cfg**.

```
<Sysname> copy test.cfg tftp://1.1.1.1/testbackup.cfg
Copy flash:/test.cfg to tftp://1.1.1.1/testbackup.cfg?[Y/N]:y
Copying file flash:/test.cfg to tftp://1.1.1.1/testbackup.cfg... Done.
```

# Copy **test.cfg** from the working directory on FTP server 1.1.1.1. Save the copy to the local current folder as **testbackup.cfg**. In this example, the FTP username and password are **user** and **private**, and the FTP server belongs to VPN instance vpn1.

```
<Sysname> copy ftp://user:private@1.1.1.1/test.cfg testbackup.cfg vpn-instance vpn1
Copy ftp://user:private@1.1.1.1/test.cfg to flash:/testbackup.cfg?[Y/N]:y
Copying file ftp://user:private@1.1.1.1/test.cfg to flash:/testbackup.cfg... Done.
```

# Copy **test.cfg** from the working directory on TFTP server 1.1.1.1. Save the copy to the local current folder as **testbackup.cfg**. In this example, the TFTP server belongs to VPN instance vpn1.

```
<Sysname> copy tftp://1.1.1.1/test.cfg testbackup.cfg vpn-instance vpn1
Copy tftp://1.1.1.1/test.cfg to flash:/testbackup.cfg?[Y/N]:y
Copying file tftp://1.1.1.1/test.cfg to flash:/testbackup.cfg... Done.
```

# Copy **test.cfg** from the working directory on FTP server 2001::1. Save the copy to the local current folder as **testbackup.cfg**. In this example, the FTP username and password are **user** and **private**, respectively.

```
<Sysname> copy ftp://user:private@[2001::1]/test.cfg testbackup.cfg
Copy ftp://user:private@[2001::1]/test.cfg to flash:/testbackup.cfg?[Y/N]:y
Copying file ftp://user:private@[2001::1]/test.cfg to flash:/testbackup.cfg... Done.
```

# Copy **test.cfg** from the working directory on TFTP server 2001::1. Save the copy to the local current folder as **testbackup.cfg**.

```
<Sysname> copy tftp://[2001::1]/test.cfg testbackup.cfg
Copy tftp://[2001::1]/test.cfg to flash:/testbackup.cfg?[Y/N]:y
Copying file tftp://[2001::1]/test.cfg to flash:/testbackup.cfg... Done.
```

# On an MSR4000, copy the active MPU's configuration file **test.cfg** to the root directory of the CF card on the standby MPU.

```
<Sysname> copy test.cfg slot1#cfa0:/
```

```
Copy cfa0:/test.cfg to slot1#cfa0:/test.cfg?[Y/N]:y
Copying file cfa0:/test.cfg to slot1#cfa0:/test.cfg...Done.
```

# delete

Use **delete** to delete a file.

## Syntax

**delete** [ **/unreserved** ] *file-url*

## Views

User view

## Predefined user roles

network-admin

## Parameters

**/unreserved**: Permanently deletes the specified file. If you do not specify this keyword, the command moves the file to the recycle bin.

*file-url*: Specifies the name of the file to be deleted. Asterisks (*) are acceptable as wildcards. For example, to remove files with the **.txt** extension in the current directory, enter **delete *.txt**.

## Usage guidelines

Use the **delete /unreserved** *file-url* command with caution. You cannot restore a file that was deleted with this command.

The **delete** *file-url* command (without **/unreserved**) moves the specified file to the recycle bin, unless the device is running out of storage space. If the device is running out of storage space, the file is permanently deleted.

A file moved to the recycle bin can be restored by using the **undelete** command.

Do not use the **delete** command to delete files from the recycle bin. To delete files from the recycle bin, use the **reset recycle-bin** command.

If you delete two files that have the same name but reside in different directories, both files are retained in the recycle bin. If you successively delete two files that have the same name from the same directory, only the file deleted last is retained in the recycle bin.

## Examples

# On an MSR1000/MSR2000/MSR3000, remove file **1.cfg** from the current directory.
```
<Sysname> delete 1.cfg
Delete flash:/1.cfg? [Y/N]:y
Deleting file flash:/1.cfg...Done.
```

# On an MSR1000/MSR2000/MSR3000, permanently delete file **2.cfg** from the current directory.
```
<Sysname> delete /unreserved 2.cfg
The file cannot be restored. Delete flash:/2.cfg?[Y/N]:y
Deleting the file permanently will take a long time. Please wait...
Deleting file flash:/2.cfg...Done.
```

# On an MSR4000, remove file **1.cfg** from the root directory of the active MPU's storage medium.
```
<Sysname> delete 1.cfg
Delete flash:/1.cfg? [Y/N]:y
```

```
Deleting file flash:/1.cfg...Done.
```

# On an MSR4000, permanently delete file **2.cfg** from the root directory of the active MPU's storage medium.

```
<Sysname> delete /unreserved 2.cfg
The file cannot be restored. Delete flash:/2.cfg?[Y/N]:y
Deleting the file permanently will take a long time. Please wait...
Deleting file flash:/2.cfg...Done.
```

# On an MSR4000, remove the **1.cfg** file from the root directory of the storage medium on the standby MPU (in slot 1):

- Method 1

```
<Sysname> delete slot1#cfa0:/1.cfg
Delete slot1#cfa0:/1.cfg?[Y/N]:y
Deleting file slot1#cfa0:/1.cfg...Done.
```

- Method 2

```
<Sysname> cd slot1#cfa0:/
<Sysname> delete 1.cfg
Delete slot1#cfa0:/1.cfg?[Y/N]:y
Deleting file slot1#cfa0:/1.cfg...Done.
```

## Related commands

- **undelete**
- **reset recycle-bin**

# dir

Use **dir** to display files or folders.

## Syntax

**dir** [ **/all** ] [ *file-url* | **/all-filesystems** ]

## Views

User view

## Predefined user roles

network-admin

## Parameters

**/all**: Displays all files and folders in the current directory, visible or hidden. If you do not specify this option, only visible files and folders are displayed.

*file-url*: Displays a specific file or folder. The *file-url* argument can use the asterisk (*) as a wildcard. For example, to display files with the **.txt** extension in the current directory, enter **dir *.txt**.

**/all-filesystems**: Displays files and folders in the root directory of all storage media on the device.

## Usage guidelines

If no option is specified, the command displays all visible files and folders in the current directory.

The folder name of the recycle bin is **.trash**. To display files in the recycle bin, use either of the following methods:

- Execute the **dir /all .trash** command.

- Execute the **cd .trash** command and then the **dir** command.

## Examples

# On an MSR1000/MSR2000/MSR3000, display information about all files and folders in the current directory.
```
<Sysname> dir /all
Directory of flash:/
...
```

# On an MSR1000/MSR2000/MSR3000, display files and folders in the root directory of all storage media on the device.
```
<Sysname> dir /all-filesystems
Directory of flash:/
...
```

# On an MSR4000, display information about all files and folders in the current directory.
```
<Sysname> dir /all
Directory of cfa0:/
...
```

# On an MSR4000, display files and folders in the root directory of all storage media on the device.
```
<Sysname> dir /all-filesystems
Directory of cfa0:/
...
Directory of slot7#cfa0:/
...
```

# On an MSR4000, display information about all files and folders in the storage medium of the standby MPU (in slot 1).
```
<Sysname> cd slot1#cfa0:/
<Sysname> dir /all
Directory of slot1#cfa0:/
...
```

Table 17 Command output

| Field | Description |
|---|---|
| Directory of | Current directory. |
| 0    -rwh    3144  Apr 26 2008 13:45:28   xx.xx | File or folder information:<br>• **0**—File or folder number, which is automatically allocated by the system.<br>• **-rwh**—Attributes of the file or folder. The first character is the folder indicator (**d** for folder and **–** for file). The second character indicates whether the file or folder is readable (**r** for readable). The third character indicates whether the file or directory is writable (**w** for writable). The fourth character indicates whether the file or directory is hidden (**h** for hidden, **-** for visible). Modifying, renaming, or deleting hidden files might affect functions.<br>• **3144**—File size in bytes. For a folder, a hyphen (-) is displayed.<br>• **Apr 26 2008 13:45:28**—Last date and time when the file or folder was modified.<br>• **xx.xx**—File or folder name. |

# file prompt

Use **file prompt** to set the operation mode for files and folders.

## Syntax

**file prompt** { **alert** | **quiet** }

**undo file prompt**

## Default

The operation mode is **alert**. The system prompts for confirmation when you perform a destructive file or folder operation.

## Views

System view

## Predefined user roles

network-admin

## Parameters

**alert**: Prompts for confirmation when a destructive file or folder operation is being performed.

**quiet**: Gives no confirmation prompt for file or folder operations.

## Usage guidelines

In quiet mode, the system does not prompt for confirmation when a user performs a file or folder operation. The **alert** mode provides an opportunity to cancel a disruptive operation.

## Examples

# Set the file and folder operation mode to **alert**.

```
<Sysname> system-view
[Sysname] file prompt alert
```

# fixdisk

Use **fixdisk** to check a storage medium for damage and repair any damage.

## Syntax

**fixdisk** *medium-name*

## Views

User view

## Predefined user roles

network-admin

## Parameters

*medium-name*: Specifies the name of a storage medium.

## Usage guidelines

Use this command to fix a storage medium when space on the medium cannot be used or released due to abnormal operations.

Before you repair a storage medium, make sure no other users are accessing the medium. Otherwise, the repair operation fails.

## Examples

# Restore the space of the flash memory.

```
<Sysname> fixdisk flash:
Restoring flash: may take some time...
Restoring flash:...Done.
```

# format

Use **format** to format a storage medium.

## Syntax

**format** *medium-name*

## Views

User view

## Predefined user roles

network-admin

## Parameters

*medium-name*: Specifies the name of a storage medium.

## Usage guidelines

Formatting a storage medium permanently deletes all files on the storage medium. If a startup configuration file exists on the storage medium, back it up if necessary.

You can format a storage medium only when no one is accessing the medium.

## Examples

# Format the flash memory.

```
<Sysname> format flash:
All data on flash: will be lost, continue? [Y/N]:y
Formatting flash:... Done.
```

# gunzip

Use **gunzip** to decompress a file.

## Syntax

**gunzip** *filename*

## Views

User view

## Predefined user roles

network-admin

### Parameters

*filename*: Specifies the name of the file to be decompressed. This argument must have .gz as the extension.

### Usage guidelines

This command deletes the specified file after decompressing it.

### Examples

# Decompress the file **system.bin.gz**.

1.  Before decompressing the file, you can display files whose names start with the **system.** string.

```
<Sysname> dir system.*
Directory of flash:
    1 -rw-          20 Jun 14 2012 10:18:53   system.bin.gz
472972 KB total (472840 KB free)
```

2.  Decompress the file **system.bin.gz**.

```
<Sysname> gunzip system.bin.gz
```

3.  Verify the decompress operation.

```
<Sysname> dir system.*
Directory of flash:
    1 -rw-           0 May 30 2012 11:42:25   system.bin
472972 KB total (472844 KB free)
```

# gzip

Use **gzip** to compress a file.

### Syntax

**gzip** *filename*

### Views

User view

### Predefined user roles

network-admin

### Parameters

*filename*: Specifies the name of the file to be compressed. The compressed file will be saved to file *filename*.gz.

### Usage guidelines

This command deletes the specified file after compressing it.

### Examples

# Compress the file **system.bin**.

1.  Before compressing the file, you can display files whose names start with **system**.

```
<Sysname> dir system.*
Directory of flash:
    1 -rw-           0 May 30 2012 11:42:24   system.bin
472972 KB total (472844 KB free)
```

2. Compress the file **system.bin**.

```
<Sysname> gzip system.bin
```

3. Verify the compress operation.

```
<Sysname> dir system.*
Directory of flash:
   1 -rw-          20 Jun 14 2012 10:18:53   system.bin.gz
472972 KB total (472840 KB free)
```

# md5sum

Use **md5sum** to use the MD5 algorithm to calculate the digest of a file.

## Syntax

**md5sum** *file-url*

## Views

User view

## Predefined user roles

network-admin

network-admin

## Parameters

*file-url*: Specifies the name of a file.

## Usage guidelines

You can use file digests to verify file integrity.

## Examples

\# Use the MD5 algorithm to calculate the digest of file **system.bin**.

```
<Sysname> md5sum system.bin
MD5 digest:
4f22b6190d151a167105df61c35f0917
```

# mkdir

Use **mkdir** to create a folder in the current directory.

## Syntax

**mkdir** *directory*

## Views

User view

## Predefined user roles

network-admin

## Parameters

*directory*: Specifies the name of a folder.

### Usage guidelines

The name of the folder to be created must be unique in the specified directory.

To use this command to create a folder, the specified directory must already exist. For example, to create the **flash:/test/mytest** folder, the **test** folder must already exist. Otherwise, the **mytest** folder is not created.

### Examples

# Create the **test** folder in the current directory.
```
<Sysname> mkdir test
Creating directory flash:/test... Done.
```

# Create the **test/subtest** folder in the current directory.
```
<Sysname> mkdir test/subtest
Creating directory flash:/test/subtest... Done.
```

# On an MSR4000, create the **test** folder on the standby MPU (in slot 1).
```
<Sysname> mkdir slot1#cfa0:/test
Creating directory slot1#cfa0:/test... Done.
```

# more

Use **more** to display the contents of a text file.

### Syntax

**more** *file-url*

### Views

User view

### Predefined user roles

network-admin

### Parameters

*file-url*: Specifies a file name.

### Examples

# Display the contents of the **test.txt** file.
```
<Sysname> more test.txt
Have a nice day.
```

# Display the contents of the **testcfg.cfg** file.
```
<Sysname> more testcfg.cfg

#
 version 7.1.042, Release 000706
#
 sysname Sysname
#
vlan 2
#
return
```

```
<Sysname>
```

# On an MSR4000, display the contents of the **testcfg.cfg** file on the standby MPU (in slot 1).

```
<Sysname> more slot1#cfa0:/testcfg.cfg


#
 version 7.1.042, Release 000706
#
 sysname Test
#
  ---- More ----
```

# mount

Use **mount** to mount a hot swappable storage medium.

## Syntax

**mount** *medium-name*

## Default

A storage medium is automatically mounted and in mounted state after being connected to the device. You can use it without mounting it.

## Views

User view

## Predefined user roles

network-admin

## Parameters

*medium-name*: Specifies the name of a storage medium.

## Usage guidelines

To avoid file system corruption, do not perform the following tasks while the system is mounting a storage medium:

- Install or remove storage media.
- Install or remove cards. (On an MSR4000.)
- Perform an active/standby switchover. (On an MSR4000.)

## Examples

# On an MSR3000, mount a CF card.

```
<Sysname> mount cfa0:
```

# On an MSR4000, mount a CF card on the active MPU.

```
<Sysname> mount cfa0:
```

## Related commands

**umount**

# move

Use **move** to move a file.

**move** *fileurl-source fileurl-dest*

## Views

User view

## Predefined user roles

network-admin

## Parameters

*fileurl-source*: Specifies the name of the source file.

*fileurl-dest*: Specifies the name of the destination file or folder.

## Usage guidelines

If you specify a destination folder, the system moves the source file to the specified folder without changing the file name.

## Examples

# Move the **flash:/test/sample.txt** file to **flash:/**, and save it as **1.txt**.

```
<Sysname> move test/sample.txt 1.txt
Move flash:/test/sample.txt to flash:/1.txt?[Y/N]:y
Moving file flash:/test/sample.txt to flash:/1.txt ...Done.
```

# Move the **b.cfg** file to the folder **test2**.

```
<Sysname> move b.cfg test2
Move flash:/b.cfg to flash:/test2/b.cfg?[Y/N]:y
Moving file flash:/b.cfg to flash:/test2/b.cfg... Done.
```

# pwd

Use **pwd** to display the current working directory.

## Syntax

**pwd**

## Views

User view

## Predefined user roles

network-admin

## Examples

# Display the current working directory.

```
<Sysname> pwd
flash:
```

# rename

Use **rename** to rename a file or folder.

## Syntax

**rename** *fileurl-source fileurl-dest*

## Views

User view

## Predefined user roles

network-admin

## Parameters

*fileurl-source*: Specifies the name of the source file or folder.

*fileurl-dest*: Specifies the name of the destination file or folder.

## Usage guidelines

This command is not executed if the destination file or folder name is already used by an existing file or folder in the current working directory.

## Examples

# Rename the **copy.cfg** file as **test.cfg**.

```
<Sysname> rename copy.cfg test.cfg
Rename flash:/copy.cfg as flash:/test.cfg?[Y/N]:y
Renaming flash:/copy.cfg as flash:/test.cfg... Done.
```

# reset recycle-bin

Use **reset recycle-bin** to delete files from the recycle bin.

## Syntax

**reset recycle-bin** [ **/force** ]

## Views

User view

## Parameters

**/force**: Deletes all files in the recycle bin without prompting for confirmation. If you do not specify this option, the command prompts you to confirm the deletion.

## Usage guidelines

The **delete** *file-url* command only moves a file to the recycle bin. To permanently delete the file, use the **reset recycle-bin** command to clear the recycle bin.

If a file is corrupted, you might not be able to delete the file by using the **reset recycle-bin** command. In this case, use the **reset recycle-bin /force** command.

## Examples

# Empty the recycle bin. (In this example there are two files in the recycle bin.)

```
<Sysname> reset recycle-bin
Clear flash:/a.cfg?[Y/N]:y
```

```
Clearing file flash:/a.cfg... Done.
Clear flash:/b.cfg?[Y/N]:y
Clearing file flash:/b.cfg... Done.
```

# Delete the **b.cfg** file from the recycle bin. (In this example there are two files in the recycle bin.)

```
<Sysname> reset recycle-bin
Clear flash:/a.cfg?[Y/N]:n
Clear flash:/b.cfg?[Y/N]:y
Clearing file flash:/b.cfg... Done.
```

## Related commands

**delete**

# rmdir

Use **rmdir** to remove a folder.

## Syntax

**rmdir** *directory*

## Views

User view

## Predefined user roles

network-admin

## Parameters

*directory*: Specifies a folder name.

## Usage guidelines

To remove a directory, you must delete all files and subfolders in the directory permanently or move them to the recycle bin. If you move them to the recycle bin, executing the **rmdir** command permanently deletes them.

## Examples

# Remove the **subtest** folder.

```
<Sysname>rmdir subtest/
Remove directory flash:/test/subtest and the files in the recycle-bin under this directory
will be deleted permanently. Continue?[Y/N]:y
Removing directory flash:/test/subtest... Done.
```

# sha256sum

Use **sha256sum** to use the SHA-256 algorithm to calculate the digest of a file.

## Syntax

**sha256sum** *file-url*

## Views

User view

### Predefined user roles

network-admin

### Parameters

*file-url*: Specifies the name of a file.

### Usage guidelines

You can use file digests to verify file integrity.

### Examples

# Use the SHA-256 algorithm to calculate the digest of file **system.bin**.

```
<Sysname> sha256sum system.bin
SHA256 digest:
0851e0139f2770e87d01ee8c2995ca9e59a8f5f4062e99af14b141b1a36ca152
```

# umount

Use **umount** to unmount a hot swappable storage medium.

### Syntax

**umount** *medium-name*

### Default

A storage medium is automatically mounted and placed in mounted state.

### Views

User view

### Predefined user roles

network-admin

### Parameters

*medium-name*: Specifies the name of a storage medium.

### Usage guidelines

Before you remove a mounted storage medium from the system, first unmount it to avoid damaging the medium.

Before you unmount a storage medium, make sure no other users are accessing the medium. Otherwise, the unmount operation fails.

When a storage medium is connected to a lower version system, the system might not be able to automatically recognize the device. In this case, you must first execute the **mount** command for the storage medium to function correctly.

To avoid file system corruption, do not perform the following tasks while the system is unmounting a storage medium:

- Install or remove storage media.
- Install or remove cards. (On an MSR4000.)
- Perform an active/standby switchover. (On an MSR4000.)

### Examples

# On an MSR3000, unmount a CF card.

```
<Sysname> umount cfa0:
```

# On an MSR4000, unmount a CF card from the active MPU.

```
<Sysname> umount cfa0:
```

## Related commands

**mount**

# undelete

Use **undelete** to restore a file from the recycle bin.

## Syntax

**undelete** *file-url*

## Views

User view

## Predefined user roles

network-admin

## Parameters

*file-url*: Specifies the name of the file to be restored.

## Usage guidelines

If a file with the same name already exists in the directory, the system prompts whether or not you want to overwrite the existing file. If you enter **Y**, the existing file is overwritten. If you enter **N**, the command is not executed.

## Examples

# Restore the **copy.cfg** file, which was moved from the **flash:** directory to the recycle bin.

```
<Sysname>undelete copy.cfg
Undelete flash:/copy.cfg?[Y/N]:y
Undeleting file flash:/copy.cfg... Done.
```

# Restore the **startup.cfg** file, which was moved from the **flash:/seclog** directory to the recycle bin.

- Method 1:

```
<Sysname>undelete seclog/startup.cfg
Undelete flash:/seclog/startup.cfg?[Y/N]:y
Undeleting file flash:/seclog/startup.cfg... Done.
<Sysname>
```

- Method 2:

```
<Sysname> cd seclog
<Sysname> undelete startup.cfg
Undelete flash:/seclog/startup.cfg?[Y/N]:y
Undeleting file flash:/seclog/startup.cfg... Done.
```

# Configuration file management commands

In this chapter, "MSR1000" refers to MSR1002-4. "MSR2000" refers to MSR2003, MSR2004-24, MSR2004-48. "MSR3000" collectively refers to MSR3012, MSR3024, MSR3044, MSR3064. "MSR4000" collectively refers to MSR4060 and MSR4080.

The device supports the FIPS mode that complies with NIST FIPS 140-2 requirements. Support for features, commands, and parameters might differ in FIPS mode and non-FIPS mode. For more information about FIPS mode, see *Security Configuration Guide*.

## archive configuration

Use **archive configuration** to manually archive the running configuration to the configuration archive directory.

### Syntax

**archive configuration**

### Views

User view

### Predefined user roles

network-admin

### Usage guidelines

Before manually archiving the running configuration, you must use the **archive configuration location** command to specify a directory as the configuration archive directory and specify an archive name prefix.

Configuration archive facilitates configuration rollback. It provides manual and automatic methods for saving the running configuration as checkpoint references. For more information about the archiving mechanism, see the section about configuration rollback in *Fundamentals Configuration Guide*.

To ensure system performance:

- If the device configuration does not change frequently, manually archive the running configuration as needed.
- If a low-speed storage medium (such as a flash memory) is used, do one of the following:
    - o Archive the running configuration manually.
    - o Configure automatic archiving with an interval longer than 1440 minutes (24 hours).
- If a high-speed storage medium (such as a CF card) is used and the device configuration changes frequently, set a shorter saving interval.

### Examples

# Archive the running configuration.

```
<Sysname> archive configuration
Save the running configuration to an archive file. Continue? [Y/N]: Y
The archive configuration file myarchive_1.cfg is saved.
```

## Related commands

- **archive configuration interval**
- **archive configuration location**
- **archive configuration max**
- **display archive configuration**

# archive configuration interval

Use **archive configuration interval** to enable automatic running-configuration archiving and set the archiving interval.

Use **undo archive configuration interval** to restore the default.

## Syntax

**archive configuration interval** *minutes*

**undo archive configuration interval**

## Default

The system does not automatically archive the running configuration.

## Views

System view

## Predefined user roles

network-admin

## Parameters

*minutes*: Specifies the interval (in minutes) for automatically saving the running configuration. The value range is 10 to 525600 (365 days).

## Usage guidelines

Before enabling automatic configuration archiving, use the **archive configuration location** command to specify the configuration archive directory and archive file name prefix.

Configuration archive is a function that facilitates configuration rollback. It provides manual and automatic methods for saving the running configuration.

Automatic configuration archiving enables the system to save the running configuration to the archive directory at the specified interval. For more information about the archiving mechanism, see the section about configuration rollback in *Fundamentals Configuration Guide*.

To ensure system performance, follow these guidelines:

- If the device configuration does not change frequently, manually archive the running configuration as needed.
- If a low-speed storage medium (such as a flash memory) is used, do one of the following:
  - Archive the running configuration manually.
  - Configure automatic archiving with an interval longer than 1440 minutes (24 hours).
- If a high-speed storage medium (such as a CF card) is used and the device configuration changes frequently, set a shorter saving interval.

- Change the archiving interval depending on the available storage space. The shorter the interval, the more free storage space is required.

## Examples

# Configure the system to archive the running configuration every 60 minutes.

```
<Sysname> system-view
[Sysname] archive configuration interval 60
Archive files will be saved every 60 minutes.
```

## Related commands

- **archive configuration**
- **archive configuration location**
- **archive configuration max**
- **display archive configuration**

# archive configuration location

Use **archive configuration location** to configure the directory and file name prefix for archiving the running configuration.

Use **undo archive configuration location** to restore the default.

## Syntax

**archive configuration location** *directory* **filename-prefix** *filename-prefix*

**undo archive configuration location**

## Default

No configuration archive directory or configuration archive file name prefix has been set.

## Views

System view

## Predefined user roles

network-admin

## Parameters

*directory*: Specifies the name of a configuration archive directory, a case-insensitive string of 1 to 63 characters. The value for this argument must take the format *storage-medium-name***:/***folder-name*. The directory must already exist on the active MPU. (MSR4000.)

*directory*: Specifies the name of a configuration archive directory, a case-insensitive string of 1 to 63 characters. The value for this argument must take the format *storage-medium-name***:/***folder-name*. The directory must already exist on the device. (MSR1000/MSR2000/MSR3000.)

*filename-prefix*: Specifies a file name prefix for configuration archives, a case-insensitive string of 1 to 30 characters. Valid characters are letters, digits, underscores (_), and hyphens (-).

## Usage guidelines

Before archiving the running configuration, either manually or automatically, you must configure a directory and file name prefix for configuration archives.

On the MSR4000 router, the configuration archive function saves the running configuration only on the active MPU. To make sure the system can archive the running configuration after an active/standby switchover, create the configuration archive directory on both active and standby MPUs.

Configuration archives take the file name format *prefix_serial number*.**cfg**, for example, **20080620archive_1.cfg** and **20080620archive_2.cfg**. The serial number is automatically assigned from 1 to 1000, increasing by 1. After the serial number reaches 1000, it restarts from 1.

After you change the file directory or file name prefix, or reboot the device, all the following events occur:

- The old configuration archives are regarded as common configuration files.
- The configuration archive counter is reset.
- The **display archive configuration** command no longer displays the old configuration archives.
- The serial number for new configuration archives starts at 1.

The **undo archive configuration location** command removes the configuration archive directory and file name prefix settings. The command also does the following:

- Disables the configuration archive function (both manual and automatic methods).
- Restores the default settings of the **archive configuration interval** and **archive configuration max** commands.
- Clears all configuration archives.

## Examples

\# Configure the configuration archive directory as **flash:/archive/** and the archive file name prefix as **my_archive**.

```
<Sysname> mkdir flash:/archive
Creating directory flash:/archive... Done.
<Sysname> system-view
[Sysname] archive configuration location flash:/archive filename-prefix my_archive
```

## Related commands

- **archive configuration**
- **archive configuration location**
- **archive configuration max**
- **display archive configuration**

# archive configuration max

Use **archive configuration max** to set the maximum number of configuration archives.

Use **undo archive configuration max** to restore the default.

## Syntax

**archive configuration max** *file-number*

**undo archive configuration max**

## Default

Up to five configuration archives can be saved.

## Views

System view

### Predefined user roles

network-admin

### Parameters

*file-number*: Sets the maximum number of configuration archives that can be saved. The value range is 1 to 10. Adjust the setting depending on the amount of storage space available.

### Usage guidelines

Before you can set a limit on configuration archives, use the **archive configuration location** command to specify a configuration archive directory and archive file name prefix.

After the maximum number of configuration archives is reached, the system deletes the oldest archive for the new archive.

Changing the limit setting to a lower value does not cause immediate deletion of excess archives. Instead, the configuration archive function deletes the oldest *n* files when a new archive is manually or automatically saved, where *n* = current archive count – new archive limit + 1.

Suppose seven configuration archives have been saved before the archive limit is set to four. When saving a new configuration archive, the system first deletes the oldest four (7 – 4 + 1) archives.

If you execute the **undo archive configuration location** command, the default archive limit is restored.

### Examples

# Set the maximum number of configuration archives to 10.

```
<Sysname> system-view
[Sysname] archive configuration max 10
```

### Related commands

- **archive configuration**
- **archive configuration location**
- **archive configuration interval**
- **display archive configuration**

# backup startup-configuration

Use **backup startup-configuration** to back up the main next-startup configuration file to a TFTP server.

### Syntax

**backup startup-configuration to** *tftp-server* [ *dest-filename* ]

### Views

User view

### Predefined user roles

network-admin

### Parameters

*tftp-server*: Specifies a TFTP server by its IPv4 address or host name. The host name is a case-insensitive string of 1 to 253 characters. Valid characters include letters, digits, hyphens (-), underscores (_), and dots (.).

*dest-filename*: Specifies the target file name used for saving the file on the server. The file name must use the .cfg extension. If you do not specify a target file name, the source file name is used.

## Usage guidelines

This command is not supported in FIPS mode.

## Examples

# Back up the main next-startup configuration file to the TFTP server at 2.2.2.2, and set the target file name to **192-168-1-26.cfg**.

```
<Sysname> backup startup-configuration to 2.2.2.2 192-168-1-26.cfg
Backup next startup-configuration file to 2.2.2.2, please wait…finished
```

## Related commands

**restore startup-configuration**

# configuration encrypt

Use **configuration encrypt** to enable configuration encryption.

Use **undo configuration encrypt** to restore the default.

## Syntax

**configuration encrypt** { **private-key** | **public-key** }

**undo configuration encrypt**

## Default

Configuration encryption is disabled. The running configuration is saved to a configuration file without encryption.

## Views

System view

## Predefined user roles

network-admin

## Parameters

**private-key**: Encrypts configuration with a private key. All HP devices running Comware V7 software use the same private key.

**public-key**: Encrypts configuration with a public key. All HP devices running Comware V7 software use the same public key.

## Usage guidelines

Configuration encryption enables the device to automatically encrypt a configuration file when saving the running configuration to the file.

Only HP devices running Comware V7 software can decrypt the encrypted configuration file.

## Examples

# Enable the public-key method for configuration encryption.

```
<Sysname> system-view
[Sysname] configuration encrypt public-key
```

# configuration replace file

Use **configuration replace file** to perform configuration rollback.

## Syntax

**configuration replace file** *filename*

## Views

System view

## Predefined user roles

network-admin

## Parameters

*filename*: Specifies the name of the replacement configuration file for configuration rollback.

## Usage guidelines

To replace the running configuration with the configuration in a configuration file without rebooting the device, use the configuration rollback function. This function helps you revert to a previous configuration state or adapt the running configuration to different network environments.

To ensure a successful rollback:

- Make sure the replacement configuration file is created by using the configuration archive function or the **save** command on the device.
- If the configuration file is not created on the device, make sure the command lines in the configuration file are fully compatible with the device.
- Make sure the replacement configuration file is not encrypted.

## Examples

# Replace the running configuration with the configuration in the **my_archive_1.cfg** configuration file.

```
<Sysname> system-view
[Sysname] configuration replace file my_archive_1.cfg
Current configuration will be lost, save current configuration? [Y/N]:n
Now replacing the current configuration. Please wait...
Succeeded in replacing current configuration with the file my_archive_1.cfg.
```

# display archive configuration

Use **display archive configuration** to display configuration archive information, including the archive directory, archive prefix, archive interval, maximum number of archives, and saved archives.

## Syntax

**display archive configuration**

## Views

Any view

## Predefined user roles

network-admin

network-operator

## Examples

# Display configuration archive information.

```
<Sysname> display archive configuration
Location: flash:/archive
Filename prefix: my_archive
Archive interval in minutes: 120
Maximum number of archive files: 10
Saved archive files:
  No. TimeStamp              FileName
  1   Wed Jan 15 14:20:18 2012   my_archive_1.cfg
  2   Wed Jan 15 14:33:10 2012   my_archive_2.cfg
# 3   Wed Jan 15 14:49:37 2012   my_archive_3.cfg
'#' indicates the most recent archive file.
Next archive file to be saved: my_archive_4.cfg
```

**Table 18 Command output**

| Field | Description |
|---|---|
| Location | Absolute path of the directory for saving running-configuration archives. |
| Filename prefix | File name prefix for configuration archives. |
| Archive interval in minutes | Interval (in minutes) for the system to automatically archive the running configuration. |
| | If automatic configuration saving is disabled, this field is not available. |
| Maximum number of archive files | Maximum number of configuration archives that can be saved. |
| Saved archive files | Configuration archives that have been saved. |
| TimeStamp | Time when the configuration archive was created. |

## Related commands

- **archive configuration**
- **archive configuration interval**
- **archive configuration location**
- **archive configuration max**

# display current-configuration

Use **display current-configuration** to display the running configuration.

## Syntax

**display current-configuration** [ **configuration** [ *module-name* ] | **interface** [ *interface-type* [ *interface-number* ] ] ]

## Views

Any view

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### Predefined user roles

network-admin

network-operator

### Parameters

**configuration** [ *module-name* ]: Displays feature configuration. The *module-name* argument specifies a feature module. If no feature module is specified, this command displays all feature settings you have made. Available feature modules depend on your configuration.

**interface** [ *interface-type* [ *interface-number* ] ]: Displays interface configuration, where the *interface-type* argument represents the interface type and the *interface-number* argument represents the interface number.

### Usage guidelines

Use this command to verify the configuration you have made.

The system might automatically change the setting you have made for a parameter due to, for example, a system restriction. If a setting has been changed, this command displays the effective setting.

This command does not display parameters that are using the default settings.

### Examples

# Display local user configuration.

```
<Sysname> display current-configuration configuration local-user
#
local-user ftp
 password simple 123
 service-type ftp
 authorization-attribute user-role network-operator
#
local-user root
 password simple admin
 service-type ssh telnet terminal
 authorization-attribute user-role network-admin
#
return
```

# Display GigabitEthernet interface configuration.

```
<Sysname> display current-configuration interface gigabitethernet
#
interface GigabitEthernet2/1/1
 port link-mode route
#
return
```

# display default-configuration

Use **display default-configuration** to display the factory defaults.

### Syntax

**display default-configuration**

**Views**

> Any view

**Predefined user roles**

> network-admin
>
> network-operator

**Usage guidelines**

> The device is shipped with some basic settings called "factory defaults." These default settings make sure the device can start up and run correctly when it has no configuration file or the configuration file is corrupt.

**Examples**

> # Display the factory defaults.
>
> ```
> <Sysname> display default-configuration
> ```

# display saved-configuration

> Use **display saved-configuration** to display the contents of the configuration file for the next system startup.

**Syntax**

> **display saved-configuration**

**Views**

> Any view

**Predefined user roles**

> network-admin
>
> network-operator

**Usage guidelines**

> Use this command to verify that important settings have been saved to the configuration file for the next system startup.
>
> This command selects the configuration file to display in the following order:
>
> 1. If the main startup configuration file is available, this command displays the contents of the main startup configuration file.
> 2. If the main startup configuration file is not available but the backup startup configuration file is available, this command displays the contents of the backup file.
> 3. If both the main and backup startup configuration files are not available, this command does not display anything.

**Examples**

> # Display the contents of the configuration file for the next system startup.
>
> ```
> <Sysname> display saved-configuration
> #
>  version 7.1.042, Release 000702
> #
>  sysname Sysname
> ```

```
#
 ftp server enable
#
 telnet server enable
#
 domain default enable system
#
vlan 1
#
domain system
#
   ---- More ----
```

## Related commands

- **reset saved-configuration**

- **save**

# display startup

Use **display startup** to display the names of the current startup configuration file and the next-startup configuration files.

## Syntax

**display startup**

## Views

Any view

## Predefined user roles

network-admin

network-operator

## Usage guidelines

Current startup configuration file is the configuration file that has been loaded. Next-startup configuration file is the configuration file used at the next startup.

On the MSR4000 router, the standby MPU always uses the same current startup configuration file as the active MPU. After an active/standby switchover, it is normal that the current startup configuration files on the MPUs are displayed as NULL. This is because the new active MPU continues to run with the running configuration rather than rebooting with a startup configuration file.

## Examples

# Display names of the startup configuration files on the MSR1000/MSR2000/MSR3000 router.

```
<Sysname> display startup
 Current startup saved-configuration file: cfa0:/startup.cfg
 Next main startup saved-configuration file: cfa0:/startup.cfg
 Next backup startup saved-configuration file: NULL
```

**Table 19 Command output**

| Field | Description |
|---|---|
| Current startup saved-configuration file | Configuration file that the device has started up with. |
| Next main startup saved-configuration file | Primary configuration file to be used at the next startup. |
| Next backup startup saved-configuration file | Backup configuration file to be used at the next startup. |

# Display names of the startup configuration files on the MSR4000 router.

```
<Sysname> display startup
MainBoard:
 Current startup saved-configuration file: cfa0:/startup.cfg
 Next main startup saved-configuration file: cfa0:/startup.cfg
 Next backup startup saved-configuration file: NULL
Slot 1:
 Current startup saved-configuration file: cfa0:/startup.cfg
 Next main startup saved-configuration file: cfa0:/startup.cfg
 Next backup startup saved-configuration file: NULL
```

**Table 20 Command output**

| Field | Description |
|---|---|
| MainBoard | Displays the startup configuration files on the active MPU. |
| Current Startup saved-configuration file | Configuration file that the active MPU has started up with. |
| Next main startup saved-configuration file | Primary startup configuration file to be used at the next startup. |
| Next backup startup saved-configuration file | Backup startup configuration file to be used at the next startup. |
| Slot *n* | Displays the startup configuration files on the MPU in slot *n*. |

## Related commands

startup saved-configuration

# display this

Use **display this** to display the running configuration in the current view.

## Syntax

**display this**

## Views

Any view

## Predefined user roles

network-admin

network-operator

## Usage guidelines

Use this command to verify the configuration you have made in a certain view.

This command does not display parameters that are using the default settings.

For some parameters that can be successfully configured even if their dependent features are not enabled, this command displays their settings after the dependent features are enabled.

This command can be executed in any user interface view to display the running configuration of all user view interfaces.

## Examples

# Display the running configuration on interface GigabitEthernet2/1/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 2/1/1
[Sysname-GigabitEthernet2/1/1] display this
#
interface GigabitEthernet2/1/1
 port link-mode route
#
return
```

# Display the running configuration on user interfaces.

```
<Sysname> system-view
[Sysname] line vty 0
[Sysname-line-vty0] display this
#
line aux 0
 user-role network-operator
#
line con 0
 user-role network-admin
#
line vty 0 63
 authentication-mode none
 user-role network-admin
#
return
```

# reset saved-configuration

Use **reset saved-configuration** to delete next-startup configuration files.

## Syntax

**reset saved-configuration** [ **backup** | **main** ]

## Views

User view

## Predefined user roles

network-admin

## Parameters

**backup**: Deletes the backup next-startup configuration file.

**main**: Deletes the main next-startup configuration file.

## Usage guidelines

> △ CAUTION:
>
> On the MSR1000/MSR2000/MSR3000 router, this command deletes a next-startup configuration file permanently.
>
> On the MSR4000 router, this command permanently deletes the next-startup configuration files from both MPUs.

Delete a next-startup configuration file if it does not match the software version or is corrupted.

You can delete the main, the backup, or both.

To delete a file that is set as both main and backup next-startup configuration files, you must execute both the **reset saved-configuration backup** command and the **reset saved-configuration main** command. Using only one of the commands removes the specified file attribute instead of deleting the file.

For example, if the **reset saved-configuration backup** command is executed, the backup next-startup configuration file setting is set to NULL, but the file is still used as the main file. To delete the file, you must also execute the **reset saved-configuration main** command.

If no configuration file attribute is specified, the **reset saved-configuration** command deletes the main next-startup configuration file.

## Examples

\# Delete the main next-startup configuration file on the MSR1000/MSR2000/MSR3000 router.

```
<Sysname> reset saved-configuration
The saved configuration file will be erased. Are you sure? [Y/N]:y
Configuration file in cfa0: is being cleared.
Please wait ..........
Configuration file is cleared.
```

\# Delete the main next-startup configuration file on the MSR4000 router.

```
<Sysname> reset saved-configuration
The saved configuration file will be erased. Are you sure? [Y/N]:y
Configuration file in cfa0: is being cleared.
Please wait ...
..
MainBoard:
Configuration file is cleared.
Slot 1:
Erase next configuration file successfully
```

## Related commands

**display saved-configuration**

# restore startup-configuration

Use **restore startup-configuration** to download a configuration file from a TFTP server and specify it as the main next-startup configuration file.

## Syntax

**restore startup-configuration from** *tftp-server src-filename*

## Views

User view

## Predefined user roles

network-admin

## Parameters

*tftp-server:* Specifies a TFTP server's IPv4 address or host name. The host name is a case-insensitive string of 1 to 253 characters. Valid characters include letters, digits, hyphens (-), underscores (_), and dots (.).

*src-filename*: Specifies the file name of the configuration file to be downloaded.

## Usage guidelines

This command is not supported in FIPS mode.

Before restoring the configuration file for the next startup, make sure the server is reachable, the server is enabled with TFTP service, and you have read and write permissions.

This command provides an easy method for configuration file restoration by automatically performing all operations required for restoring the main next-startup configuration file.

On the MSR4000 router, this command downloads the configuration file to the root directory of the storage medium on both MPUs. The command specifies the file as the main next-startup configuration file at the same time.

## Examples

# On the MSR1000/MSR2000/MSR3000 router, download the configuration file **test.cfg** from the TFTP server at 2.2.2.2 and specify the file as the main next-startup configuration file.

```
<Sysname> restore startup-configuration from 2.2.2.2 test.cfg
Restoring the next startup-configuration file from 2.2.2.2. Please wait...finished.
```

# On the MSR4000 router, download the configuration file **test.cfg** from the TFTP server at 2.2.2.2, and specify the file as the main next-startup configuration file.

```
<Sysname> restore startup-configuration from 2.2.2.2 config.cfg
Restoring the next startup-configuration file from 2.2.2.2. Please wait...finished.
Now restoring the next startup-configuration file from main board to backup board. Please
wait...finished.
```

## Related commands

**backup startup-configuration**

# save

MSR1000/MSR2000/MSR3000:

Use **save** *file-url* to save the running configuration to a configuration file, without specifying the file as a next-startup configuration file.

Use **save** [ **safely** ] [ **backup** | **main** ] [ **force** ] to save the running configuration to a file in the root directory of a storage medium. This command specifies the file as a next-startup configuration file at the same time.

MSR4000:

Use **save** *file-url* [ **all** | **slot** *slot-number* ] to save the running configuration to a configuration file, without specifying the file as a next-startup configuration file.

Use **save** [ **safely** ] [ **backup** | **main** ] [ **force** ] to save the running configuration to a file in the root directory of a storage medium on both active MPU and standby MPU. This command specifies the file as a next-startup configuration file at the same time.

## Syntax

MSR1000/MSR2000/MSR3000:

**save** *file-url*

**save** [ **safely** ] [ **backup** | **main** ] [ **force** ]

MSR4000:

**save** *file-url* [ **all** | **slot** *slot-number* ]

**save** [ **safely** ] [ **backup** | **main** ] [ **force** ]

## Views

Any view

## Predefined user roles

network-admin

## Parameters

*file-url*: Saves the running configuration to the specified file, without specifying the file as a next-startup configuration file. The file name must use the extension .cfg and can include path information. If the file path includes a folder name, the folder must already exist. (MSR1000/MSR2000/MSR3000.)

*file-url*: Saves the running configuration to the specified file, without specifying the file as a next-startup configuration file. The file name must use the extension .cfg and can include path information. If the keyword **all** or an MPU slot is specified, the file path cannot include a slot number. If the file path includes a folder name, the folder must already exist. (MSR4000.)

**all**: Saves the running configuration to both MPUs. If you do not specify this keyword or the **slot** *slot-number* option, the command saves the running configuration only to the active MPU. (MSR4000.)

**slot** *slot-number*: Saves the running configuration to the standby MPU. If you do not specify this option or the **all** keyword, the command saves the running configuration only to the active MPU. (MSR4000.)

**safely**: Saves the configuration file in safe mode. If this keyword is not specified, the device saves the configuration file in fast mode. Safe mode is slower than fast mode, but more secure. HP recommends that you specify the **safely** keyword for the command.

**backup**: Saves the running configuration to a configuration file, and specifies the file as the backup next-startup configuration file. If you do not specify this keyword or the **main** keyword, the command specifies the saved file as the main next-startup configuration file.

**main**: Saves the running configuration to a configuration file, and specifies the file as the main next-startup configuration file. If you do not specify this keyword or the **backup** keyword, the command specifies the saved file as the main next-startup configuration file.

**force**: Saves the running configuration without prompting for confirmation. Without this keyword, the system prompts you to confirm the operation. If you do not confirm the operation within 30 seconds, the system automatically aborts the operation. If you enter **Y** within the time limit, you can continue the save process and change the target file name during the process.

## Usage guidelines

If the file specified for the command does not exist, the system creates the file before saving the configuration. If the file already exists, the system prompts you to confirm whether to overwrite the file. If you choose to not overwrite the file, the system cancels the save operation.

If you do not specify the *file-url* option for the command, the command saves the running configuration to an .mdb binary file as well as a .cfg text file. The two files use the same file name. An .mdb file takes less time to load than a .cfg file.

If you specify the *file-url* option for the command, the command only saves the running configuration to the specified .cfg file.

In safe mode, the system saves configuration in a temporary file and starts overwriting the target next-startup configuration file after the save operation is complete. If a reboot, power failure, or out of memory event occurs during the save operation, the next-startup configuration file is retained.

In fast mode, the device directly overwrites the target next-startup configuration file. If a reboot, power failure, or out of memory event occurs during this process, the next-startup configuration file is lost.

## Examples

# Save the running configuration to the configuration file **backup.cfg**, without specifying the file as the next-startup configuration file.

```
<Sysname> save backup.cfg
The current configuration will be saved to flash:/backup.cfg. Continue? [Y/N]:y
Now saving current configuration to the device.
Saving configuration
flash:/backup.cfg. Please wait...
Configuration is saved to flash successfully.
```

# Save the running configuration to the main next-startup configuration file without any confirmation required.

```
<Sysname> save force
Validating file. Please wait....
Configuration is saved to device successfully.
```

# On the MSR1000/MSR2000/MSR3000 router, save the running configuration to a file in the root directory of the storage medium, and specify the file as the main next-startup configuration file.

```
<Sysname> save
The current configuration will be written to the device. Are you sure? [Y/N]:y
Please input the file name(*.cfg)[cfa0:/backup.cfg]
(To leave the existing filename unchanged, press the enter key):test.cfg
 Validating file. Please wait...........
 Configuration is saved to device successfully.
```

# On the MSR4000 router, save the running configuration to a file in the root directory of the storage medium, and specify the file as the main next-startup configuration file.

```
<Sysname> save
The current configuration will be written to the device. Are you sure? [Y/N]:y
Please input the file name(*.cfg)[cfa0:/startup.cfg]
(To leave the existing filename unchanged, press the enter key):
Validating file. Please wait...
Saved the current configuration to mainboard device successfully.
Slot 1:
Save next configuration file successfully.
```

## Related commands

- **display current-configuration**
- **display saved-configuration**

# startup saved-configuration

MSR1000/MSR2000/MSR3000:

Use **startup saved-configuration** to specify a file as a next-startup configuration file.

Use **undo startup saved-configuration** to configure the system to start up with factory defaults at the next startup.

MSR4000:

Use **startup saved-configuration** to specify a file as a next-startup configuration file for both active MPU and standby MPU.

Use **undo startup saved-configuration** to configure the active MPU and the standby MPU to start up with factory defaults at the next startup.

## Syntax

**startup saved-configuration** *cfgfile* [ **backup** | **main** ]

**undo startup saved-configuration**

## Default

No next-startup configuration file is specified.

## Views

User view

## Predefined user roles

network-admin

## Parameters

*cfgfile*: Specifies the name of a .cfg file. This .cfg file must already exist in the root directory of storage medium.

**backup**: Specifies the configuration file as the backup next-startup configuration file.

**main**: Specifies the configuration file as the main next-startup configuration file. This is the primary configuration file that the device attempts to load at startup. If the loading attempt fails, the device tries the backup next-startup configuration file.

## Usage guidelines

On the MSR4000 router, the **startup saved-configuration** command applies to both MPUs. To successfully configure the command, verify that the specified file already exists in the root directory of the storage media on both active MPU and standby MPU.

If neither **backup** nor **main** is specified, the **startup saved-configuration** command specifies the main next-startup configuration file.

Even though the main and backup next-startup configuration files can be the same one, specify them as separate files for high availability.

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The **undo startup saved-configuration** command changes the file attribute of the main and backup next-startup configuration files to NULL, but it does not delete the two configuration files.

You can also specify a configuration file as a next startup file when you use the **save** command to save the running configuration to it.

## Examples

# Specify the main next-startup configuration file.

```
<Sysname> startup saved-configuration testcfg.cfg
Please wait ....
... Done!
```

## Related commands

**display startup**

# Software upgrade commands

In this chapter, "MSR1000" refers to MSR1002-4. "MSR2000" refers to MSR2003, MSR2004-24, MSR2004-48. "MSR3000" collectively refers to MSR3012, MSR3024, MSR3044, MSR3064. "MSR4000" collectively refers to MSR4060 and MSR4080.

## boot-loader file

Use **boot-loader file** to specify startup software image files.

### Syntax

MSR1000/MSR2000/MSR3000:

**boot-loader file boot** *boot-package* **system** *system-package* [ **feature** *feature-package*&<1-30> ] { **backup** | **main** }

**boot-loader file** *ipe-filename* { **backup** | **main** }

MSR4000:

**boot-loader file boot** *boot-package* **system** *system-package* [ **feature** *feature-package*&<1-30> ] { **all** | **slot** *slot-number* } { **backup** | **main** }

**boot-loader file** *ipe-filename* { **all** | **slot** *slot-number* } { **backup** | **main** }

### Views

User view

### Predefined user roles

network-admin

### Parameters

**boot** *boot-package*: Specifies the file path of a .bin boot image file, a case-insensitive string. The file must be stored in the root directory of a storage medium in the system. The maximum length is 1 to 63 characters for the *storage-medium:/base-filename***.bin** segments of the file path. On the MSR4000 router, this length limit does not include the slot number in front of the storage medium segment. For more information about specifying a file path, see "Managing the file system."

**system** *system-package*: Specifies the file path of a .bin system image file, a case-insensitive string. The file must be stored in the root directory of a storage medium in the system. The maximum length is 1 to 63 characters for the *storage-medium:/base-filename***.bin** segments of the file path. On the MSR4000 router, this length limit does not include the slot number information in front of the storage medium segment. For more information about specifying a file path, see "Managing the file system."

**feature** *feature-package*: Specifies a space-separated list of up to 30 .bin feature image file paths. The file paths are case insensitive. The files must be stored in the root directory of a storage medium in the system. The maximum length is 1 to 63 characters for the *storage-medium:/base-filename***.bin** segments of a file path. On the MSR4000 router, this length limit does not include the slot number information in front of the storage medium segment. For more information about specifying a file path, see "Managing the file system."

*ipe-filename*: Specifies the file path of an .ipe image package file, a case-insensitive string. The file must be stored in the root directory of a storage medium in the system. The maximum length is 1 to 63 characters for the *storage-medium:/base-filename***.ipe** segments of the file path. On the MSR4000 router, this length limit does not include the slot number information in front of the storage medium segment.

**all**: Specifies startup images for all cards.

**slot** *slot-number*: Specifies the slot number of an MPU.

**backup**: Specifies the files as backup startup image files. Backup images are used only when main images are not available.

**main**: Specifies the files as main startup image files. The device always first attempts to start up with main startup files.

### Usage guidelines

On the MSR4000 router, use this command to upgrade the startup software images on both MPUs. To upgrade the standby MPU with the startup images on the active MPU, you can also use the **boot-loader update** command.

Before you specify startup software image files, perform the following tasks:

- Save the upgrade files to the root directory of the storage medium.

  On the MSR4000 router, you can save the upgrade file to the root directory of the CF card on any MPU. If the file is not on the MPU you are upgrading, the router automatically copies the images from the specified file path to the MPU. If a file with the same name already exists in the destination directory, you must choose whether to overwrite the file.

- If the specified software images require a license, register and activate a license for each image. If a license-based software image lacks a license, the command execution result is as follows:

  o If .bin files are specified, the command cannot be issued.

  o If an .ipe file is specified, the command can set all the images except the license-based image that lacks a license.

  For more information about licensing, see *Fundamentals Configuration Guide*.

The **boot-loader file** command overwrites the entire startup software image list. To add new startup feature images, specify all feature image files, including feature image files in the old startup software image list. The new startup software image list will contain only the feature image files that are specified in the command.

### Examples

# Specify **cfa0:/all.ipe** as the main startup image file on an MSR1000, MSR2000 or MSR3000 router.

```
<Sysname> boot-loader file cfa0:/all.ipe main
Verifying the IPE file and the images............Done.
Images in IPE:
  boot.bin
  system.bin
This command will set the main startup software images. Continue? [Y/N]:Y
Add images to the device.
File cfa0:/boot.bin already exists on the device.
File cfa0:/system.bin already exists on the device.
Overwrite the existing files? [Y/N]:Y
Decompressing file boot.bin to cfa0:/boot.bin........................Done.
Decompressing file system.bin to cfa0:/system.bin..............................Done.
```

```
The images that have passed all examinations will be used as the main startup software
images at the next reboot on the device..
```

# Specify **cfa0:/all.ipe** as the main startup image file for the MPU in slot 0 on an MSR4000 router.

```
<Sysname> boot-loader file cfa0:/all.ipe slot 0 main
Verifying the IPE file and the images............Done.
Images in IPE:
  boot.bin
  system.bin
This command will set the main startup software images. Continue? [Y/N]:Y
Add images to target slot.
File cfa0:/boot.bin already exists on slot 0.
File cfa0:/system.bin already exists on slot 0.
Overwrite the existing files? [Y/N]:Y
Decompressing file boot.bin to cfa0:/boot.bin........................Done.
Decompressing file system.bin to cfa0:/system.bin...............................Done.
The images that have passed all examinations will be used as the main startup software
images at the next reboot on slot 0.
```

## Related commands

- **boot-loader blade file**
- **display boot-loader**

# boot-loader update

Use **boot-loader update** to synchronize startup images from the active MPU to the standby MPU.

## Syntax

**boot-loader update** { **all** | **slot** *slot-number* }

The following matrix shows the support of MSR routers for the command:

| Hardware | Command compatibility |
|----------|----------------------|
| MSR1000 | No |
| MSR2000 | No |
| MSR3000 | No |
| MSR4000 | Yes |

## Views

User view

## Predefined user roles

network-admin

## Parameters

**all**: Upgrades the standby MPU.

**slot** *slot-number*: Specifies the slot number of the standby MPU.

## Usage guidelines

You can use this command to synchronize startup images after adding an additional MPU.

If any startup software images require a license, register and activate a license for the images on the new MPU before executing this command. To verify the licensing state of software images, use the **display license feature** command .

The startup images synchronized to the standby MPU are set as main startup images, regardless of whether the source startup images are main or backup.

- If the active MPU started up with main startup images, its main startup images are synchronized to the standby MPU.
- If the active MPU started up with backup startup images, its backup startup images are synchronized to the standby MPU.

The synchronization is performed regardless of whether or not the source startup image list has been modified after the active MPU started up.

Startup image synchronization fails if any software image being synchronized is corrupted or not available.

If an ISSU patch installation or software upgrade has been performed, use the **install commit** command to update the main startup images on the active MPU before software synchronization. This command ensures startup image consistency between the MPUs.

## Examples

# Synchronize startup images from the active MPU to the standby MPU in slot 1.

```
<Sysname> boot-loader update slot 1
This command will update the specified standby MPU. Continue? [Y/N]:y
Updating. Please wait...
Copying main startup software images to slot 1. Please wait...
Done.
Setting copied images as main startup software images for slot 1...
Done.
Successfully updated the startup software images of slot 1.
```

## Related commands

- **display boot-loader**
- **install commit**

# bootrom update

Use **bootrom update** to load the Boot ROM image.

## Syntax

MSR1000/MSR2000/MSR3000:

**bootrom update file** *file-url* [ **slot** *slot-number-list* ]

MSR4000:

**bootrom update file** *file-url* **slot** *slot-number-list* [ **subslot** *subslot-number-list* ]

## Views

User view

## Predefined user roles

network-admin

## Parameters

**file** *file-url*: Specifies the file that contains the Boot ROM image in the flash memory or CF card. The *file-url* argument represents the file name, a string of 1 to 63 characters.

**slot** *slot-number-list*: Specifies a space-separated list of up to seven slot number items. Each item specifies a card by its slot number or a range of cards in the form of *start-slot-number* **to** *end-slot-number*. For example, **slot 0 to 1 2**.

**subslot** *subslot-number-list*: Specifies a list of up to seven subslot number items. Each item specifies a subcard by its subslot number or a range of subcards in the form of *start-subslot-number* **to** *end-subslot-number*. If you do not specify a subcard, this command loads the Boot ROM image for the base card.

## Usage guidelines

Boot ROM image is integrated with the .bin Boot image. To upgrade the Boot ROM image, use the .bin Boot image file.

Typically, the Boot ROM image is upgraded automatically when the Boot image is upgraded. You can also use this command to preload the new Boot ROM image to the Boot ROM before upgrading Comware images. This command helps shorten the subsequent upgrade time, reducing the risk of upgrade failure caused by unexpected electricity failure.

To complete the upgrade, reboot the device.

To save space, you can delete the Boot ROM image file from the flash memory or CF card after completing the Boot ROM image upgrade.

## Examples

# Use the file **a.bin** to upgrade the Boot ROM image on an MSR1000, MSR2000 or MSR3000 router.

```
<Sysname> bootrom update file a.bin
   This command will update the Boot ROM file on the specified board(s), Continue? [Y/N]:y
   Now updating the Boot ROM, please wait...
.............Done.
```

## Related commands

**boot-loader file**

# display boot-loader

Use **display boot-loader** to display current software images and startup software images.

## Syntax

MSR1000/MSR2000/MSR3000:

**display boot-loader**

MSR4000:

**display boot-loader** [ **slot** *slot-number* ]

## Views

Any view

## Predefined user roles

network-admin

network-operator

## Parameters

**slot** *slot-number*: Specifies the slot number of an MPU. If you do not specify an MPU, this command displays the software images on each MPU.

## Examples

# Display the current software images and startup software images on an MSR1000, MSR2000 or MSR3000 router.

```
<Sysname> display boot-loader
Software images on the device:
Current software images:
  cfa0:/msr36-cmw710-boot-e010203.bin
  cfa0:/msr36-cmw710-system-e010203.bin
  cfa0:/msr36-cmw710-security-e010203.bin
  cfa0:/msr36-cmw710-voice-e010203.bin
  cfa0:/msr36-cmw710-data-e010203.bin
Main startup software images:
  cfa0:/msr36-cmw710-boot-e010203.bin
  cfa0:/msr36-cmw710-system-e010203.bin
  cfa0:/msr36-cmw710-security-e010203.bin
  cfa0:/msr36-cmw710-voice-e010203.bin
  cfa0:/msr36-cmw710-data-e010203.bin
Backup startup software images:
  cfa0:/msr36-cmw710-boot-r000701.bin
  cfa0:/msr36-cmw710-system-r000701.bin
  cfa0:/msr36-cmw710-security-r000701.bin
  cfa0:/msr36-cmw710-voice-r000701.bin
  cfa0:/msr36-cmw710-data-r000701.bin
```

# Display the current software images and startup software images on an MSR4000 router.

```
<Sysname> display boot-loader
Software images on slot 0:
Current software images:
cfa0:/msr56-cmw710-boot-e010203.bin
  cfa0:/msr56-cmw710-system-e010203.bin
  cfa0:/msr56-cmw710-security-e010203.bin
  cfa0:/msr56-cmw710-voice-e010203.bin
  cfa0:/msr56-cmw710-data-e010203.bin
Main startup software images:
  cfa0:/msr56-cmw710-boot-e010203.bin
  cfa0:/msr56-cmw710-system-e010203.bin
  cfa0:/msr56-cmw710-security-e010203.bin
  cfa0:/msr56-cmw710-voice-e010203.bin
  cfa0:/msr56-cmw710-data-e010203.bin
Backup startup software images:
  cfa0:/msr56-cmw710-boot-e010203.bin
```

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```
  cfa0:/msr56-cmw710-system-e010203.bin
  cfa0:/msr56-cmw710-security-e010203.bin
  cfa0:/msr56-cmw710-voice-e010203.bin
  cfa0:/msr56-cmw710-data-e010203.bin
Software images on slot 1:
Current software images:
  cfa0:/msr56-cmw710-boot-e010203.bin
  cfa0:/msr56-cmw710-system-e010203.bin
  cfa0:/msr56-cmw710-security-e010203.bin
  cfa0:/msr56-cmw710-voice-e010203.bin
  cfa0:/msr56-cmw710-data-e010203.bin
Main startup software images:
  cfa0:/msr56-cmw710-boot-e010203.bin
  cfa0:/msr56-cmw710-system-e010203.bin
  cfa0:/msr56-cmw710-security-e010203.bin
  cfa0:/msr56-cmw710-voice-e010203.bin
  cfa0:/msr56-cmw710-data-e010203.bin
Backup startup software images:
  cfa0:/msr56-cmw710-boot-e010203.bin
  cfa0:/msr56-cmw710-system-e010203.bin
  cfa0:/msr56-cmw710-security-e010203.bin
  cfa0:/msr56-cmw710-voice-e010203.bin
  cfa0:/msr56-cmw710-data-e010203.bin
```

**Table 21 Command output**

| Field | Description |
|---|---|
| Software images on the device | This field displays the Comware images on an MSR1000, MSR2000 or MSR3000 router. |
| Software images on slot *slot-number* | This field displays the Comware images on the MPU in a specific slot on an MSR4000 router. |
| Current software images | Comware images that have been loaded. |
| Main startup software images | Main Comware images for the next startup. |
| Backup startup software images | Backup Comware images for the next startup. |

**Related commands**

**boot-loader file**

# version auto-update enable

Use **version auto-update enable** to enable software synchronization from the active MPU to the standby MPU at startup.

Use **undo version auto-update enable** to disable the function.

**Syntax**

**version auto-update enable**

**undo version auto-update enable**

The following matrix shows the support of MSR routers for the command:

| Hardware | Command compatibility |
|---|---|
| MSR1000 | No |
| MSR2000 | No |
| MSR3000 | No |
| MSR4000 | Yes |

## Default

If software inconsistency is detected at startup, the standby MPU loads the current software images of the active MPU.

## Views

System view

## Predefined user roles

network-admin

## Usage guidelines

To ensure that the standby MPU always runs the same software images as the active MPU, configure both the **version auto-update enable** command and the **undo version check ignore** command.

The startup software version check function examines the standby MPU's startup software images for version inconsistency with the active MPU's current software images at startup. If their software versions are different, the standby MPU copies the current software images of the active MPU, specifies them as main startup software images, and reboots with these images.

To ensure a successful synchronization in a multi-user environment, make sure no one reboots or swaps MPUs during the software synchronization process. You can configure the information center to output the synchronization status to configuration terminals (see *Network Management and Monitoring Configuration Guide*).

## Examples

# Enable software auto-update for the standby MPU.

```
<Sysname> system-view
[Sysname] version auto-update enable
```

## Related commands

**version check ignore**

# version check ignore

Use **version check ignore** to disable startup software version check for the standby MPU at startup.

Use **undo version check ignore** to enable this function.

## Syntax

**version check ignore**

**undo version check ignore**

The following matrix shows the support of MSR routers for the command:

| Hardware | Command compatibility |
|----------|----------------------|
| MSR1000 | No |
| MSR2000 | No |
| MSR3000 | No |
| MSR4000 | Yes |

### Default

The startup software images on the standby MPU are checked for version inconsistency with the current software images on the active MPU.

### Views

System view

### Predefined user roles

network-admin

### Usage guidelines

When the standby MPU starts up, this command disables the system to examine the standby MPU's startup software images for version inconsistency with the active MPU's current software images. The standby MPU can start up with a different software version than the active MPU.

Even though you can use this command for software upgrade, HP recommends the ISSU method. The startup software version check function might fail to work if the software versions of the MPUs are incompatible.

To avoid unexpected problems, do not disable startup software version check for the standby MPU unless for software upgrade.

To ensure that the standby MPU always runs the same software images as the active MPU, configure both the **version auto-update enable** command and the **undo version check ignore** command.

### Examples

# Enable startup software version check for the standby MPU.

```
<Sysname> system-view
[Sysname] undo version check ignore
```

### Related commands

**version auto-update enable**

# Emergency shell commands

In this chapter, "MSR1000" refers to MSR1002-4. "MSR2000" refers to MSR2003, MSR2004-24, MSR2004-48. "MSR3000" collectively refers to MSR3012, MSR3024, MSR3044, MSR3064. "MSR4000" collectively refers to MSR4060 and MSR4080.

Unless otherwise stated, a file name or path argument in this document is case insensitive and must indicate the storage medium. The path information might contain multiple levels of directories, and each can include 1 to 255 characters. The file name alone (without the path information) can include 1 to 255 characters. The argument, including the storage medium, the path information, and the file name, can include 1 to 511 characters. (On an MSR1000, MSR2000 or MSR3000.)

Unless otherwise stated, a file name or path argument in this document is case insensitive, and must indicate the storage medium and contain no slot information. The path information might contain multiple levels of directories, and each can include 1 to 255 characters. The file name alone (without the path information) can include 1 to 255 characters. The argument, including the storage medium, the path information, and the file name, can include 1 to 511 characters. (On an MSR4000.)

## copy

Use **copy** to copy a file.

### Syntax

**copy** *fileurl-source fileurl-dest*

### Views

User view

### Parameters

*fileurl-source*: Specifies the name of the file to be copied.

*fileurl-dest*: Specifies the name of the destination file or directory. If you specify a destination directory, the system uses the name of the source file as the file name.

### Usage guidelines

If the destination file already exists, the system prompts whether or not to overwrite it.

### Examples

# Copy the **test.cfg** file and save it in the same directory as **testbackup.cfg**.
```
<boot> copy flash:/testcfg.cfg flash:/testbackup.cfg
Copy flash:/test.cfg to flash:/testbackup.cfg?[Y/N]:y
Start to copy flash:/test.cfg to flash:/testbackup.cfg...Done.
```

# Copy the **test.cfg** file and save it in the same directory by using the name of existing file **testbackup.cfg**. (The existing file is overwritten.)
```
<boot> copy flash:/testcfg.cfg flash:/testbackup.cfg
Copy flash:/test.cfg to flash:/testbackup.cfg?[Y/N]:y
flash:/testbackup.cfg already exists. Overwrite it?[Y/N]:y
Start to copy flash:/test.cfg to flash:/testbackup.cfg...Done.
```

# delete

Use **delete** to permanently delete a file.

**Syntax**

**delete** *file-url*

**Views**

User view

**Parameters**

*file-url*: Specifies the name of the file to be deleted.

**Examples**

# Delete the **tt.cfg** file from the current directory.
```
<boot> delete flash:/tt.cfg
Delete flash:/tt.cfg? [Y/N]:y
Deleting the file permanently will take a long time. Please wait...
Start to delete flash:/tt.cfg...Done.
```

# dir

Use **dir** to display files or directories.

**Syntax**

**dir** [ **/all** ] [ *file-url* ]

**Views**

User view

**Parameters**

**/all**: Displays both hidden and non-hidden files and subdirectories.

*file-url*: Specifies a file or directory.

**Usage guidelines**

| Task | Command | Remarks |
|------|---------|---------|
| Display all non-hidden files and subdirectories in the current directory. | **dir** | N/A |
| Display all files and subdirectories in the current directory. | **dir /all** | N/A |
| Display all non-hidden files and subdirectories in a directory. | **dir** *file-url* | Specify a directory for the *file-url* argument. |
| Display all files and subdirectories in a directory. | **dir /all** *file-url* | Specify a directory for the *file-url* argument. |
| Display a file. | **dir** *file-url* | Specify a file for the *file-url* argument. |

# Display information about all files and directories in the system.

```
<boot> dir /all
Directory of flash:
     0      drw-              -  Jan 01 2012 00:06:09      01
     1      drw-              -  Sep 15 2012 04:03:14      pki
     2      drw-              -  Jan 01 2012 00:04:07      test
     3      drw-              -  Aug 26 2012 02:48:00      license
     4      drw-              -  Nov 05 2012 06:45:07      logfile
     5      -rwh             20  Oct 20 2012 09:09:52      .snmpboots
     6      drw-              -  Nov 05 2012 05:56:22      diagfile
     7      drwh              -  Aug 20 2012 09:23:48      .trash
     8      -rw-            816  Aug 20 2012 06:15:00      ifindex.dat
     9      -rw-           3231  Aug 31 2012 09:01:41      startup.cfg
    10      -rw-          60620  Aug 31 2012 09:01:43      startup.mdb
    11      drw-              -  Sep 30 2012 04:43:24      versionInfo
    12      drw-              -  Nov 05 2012 05:56:22      seclog
    13      -rwh             18  Aug 20 2012 09:09:34      .pathfile
    14      -rw-       11238400  Aug 30 2012 11:06:53      boot-t2301001.bin
    15      -rw-              0  Aug 31 2012 05:04:40      lauth.dat
    16      -rw-           4383  Oct 20 2012 06:15:00      test.cfg

61440 KB total (11108 KB free)
```

# Display all unhidden files and directories in the system.

```
<boot> dir
Directory of flash:
     0      drw-              -  Jan 01 2012 00:06:09      01
     1      drw-              -  Sep 15 2012 04:03:14      pki
     2      drw-              -  Jan 01 2012 00:04:07      test
     3      drw-              -  Aug 26 2012 02:48:00      license
     4      drw-              -  Nov 05 2012 06:45:07      logfile
     5      drw-              -  Nov 05 2012 05:56:22      diagfile
     6      -rw-            816  Aug 20 2012 06:15:00      ifindex.dat
     7      -rw-           3231  Aug 31 2012 09:01:41      startup.cfg
     8      -rw-          60620  Aug 31 2012 09:01:43      startup.mdb
     9      drw-              -  Sep 30 2012 04:43:24      versionInfo
    10      drw-              -  Nov 05 2012 05:56:22      seclog
    11      -rw-       11238400  Aug 30 2012 11:06:53      boot-t2301001.bin
    12      -rw-              0  Aug 31 2012 05:04:40      lauth.dat
    13      -rw-           4383  Aug 20 2012 06:15:00      test.cfg

61440 KB total (11108 KB free)
```

# Display information about the **config.cfg** file.

```
<boot> dir flash:/config.cfg
Directory of flash:
     0      -rw-           3231  Aug 31 2013 09:01:41      startup.cfg
```

```
61440 KB total (11108 KB free)
```

**Table 22 Command output**

| Field | Description |
|---|---|
| Directory of | Current directory. |
| 7    -rw-     3231  Aug 31 2013 09:01:41    startup.cfg | Information about a file or directory: <br>• **7**—Index number, automatically assigned by the system. <br>• **-rw-**—Attributes of the file or directory. The first character is the directory indicator (**d** for directory and **-** for file). The second character indicates whether the file or directory is readable (**r** for readable). The third character indicates whether the file or directory is writable (**w** for writable). The last character indicates whether the file or directory is hidden (**h** for hidden and **-** for visible). <br>• **3231**—Size of the file, in bytes. For a directory, the value of this field is a hyphen (**-**). <br>• **Aug 31 2013 09:01:41**—Time when the file was most recently modified. <br>• **startup.cfg**—Name of the file or directory. |
| 61440 KB total (11108 KB free) | Total size of the storage medium and size of the free space, in kilobytes. |

# display copyright

Use **display copyright** to display the copyright information.

## Syntax

**display copyright**

## Views

Any view

## Examples

# Display the copyright information.

```
<boot> display copyright
…
```

# display install package

Use **display install package** to display information about a software package.

## Syntax

**display install package** *package*

## Views

Any view

## Parameters

*package*: Specifies a software package name with the extension .bin, a case-insensitive string of 1 to 63 characters. This argument must indicate the name of the storage medium, such as flash:/a.bin. The software package must be saved in the root directory of the storage medium.

## Examples

# Display information about the **system.bin** software package.

```
<boot> display install package flash:/system.bin
  flash:/system.bin
  [Package]
  Vendor: HP
  Product: xxxx
  Service name: system
  Platform version: 7.1.049P01
  Product version: ESS 010203
  Supported board: mpu
  [Component]
  Component: Comware system
  Description: system package
```

**Table 23 Command output**

| Field | Description |
|---|---|
| Product | Product name. |
| Service name | Type of the service package:<br>• **boot**—Boot image.<br>• **system**—System image.<br>• **patch**—Patch package.<br>The value of this field is any other value for feature packages. |
| Platform version | Platform version number. |
| Product version | Product version number. You determine whether the version of a system image matches that of a boot image by checking the value of this field. |
| Supported board | Types of cards that the software package supports:<br>• **mpu**—MPU.<br>• **lc**—Service card.<br>• **sfc**—Switching fabric card. |
| [Component] | Information about the components of the software package. |

# display interface m-eth0

Use **display interface m-eth0** to display information about the management Ethernet port M-Eth 0.

## Syntax

**display interface m-eth0**

## Views

Any view

## Examples

# Display information about the management Ethernet port.

```
<boot> display interface m-eth0
 m-eth0 current state: UP
```

```
Line protocol current state: UP
The Maximum Transmit Unit is 1500
Inet4 Address is 192.168.20.189/24
Inet6 Address is 1:1::1:1/64 Scope:Global
Inet6 Address is FE80::202:3FF:FE04:506/10 Scope:Link
IP Packet Frame Type:PKTFMT_ETHNT_2, Hardware Address: c4ca-d94c-e201
IPV6 Packet Frame Type:PKTFMT_ETHNT_2, Hardware Address: c4ca-d94c-e201
Input:  8983 packets, 0 errors, 0 dropped, 0 overruns, 2 frame
Output: 431 packets, 0 errors, 0 dropped, 0 overruns, 0 carrier,
        0 collisions, 1000 txqueuelen
Input bytes:804168
Output bytes:30367
```

**Table 24 Command output**

| Field | Description |
|---|---|
| m-eth0 current state | Physical layer status of the management Ethernet interface: <br>• **Administratively DOWN**—The interface has been shut down by using the **shutdown** command. <br>• **DOWN**—The interface has been enabled by using the **undo shutdown** command but its physical status is down. The interface might not have a cable connected or the cable has a problem. <br>• **UP**—The interface has been enabled by using the **undo shutdown** command, and its physical status is up. |
| Line protocol current state | Link layer status of the interface. |
| The Maximum Transmit Unit | MTU of the interface. |
| Inet4 Address | IPv4 address of the interface. This field is displayed only when the device is configured with an IPv4 address. |
| Inet6 Address | IPv6 global unicast address of the interface. This field is displayed only when the device is configured with an IPv6 address. |
| Inet6 Address is FE80::202:3FF:FE04:506/10 Scope:Link | IPv6 link-local address of the interface. |
| IP Packet Frame Type:PKTFMT_ETHNT_2, Hardware Address: c4ca-d94c-e201 | Link layer encapsulation type and hardware address for IPv4 packets. |
| IPV6 Packet Frame Type:PKTFMT_ETHNT_2, Hardware Address: c4ca-d94c-e201 | Link layer encapsulation type and hardware address for IPv6 packets. |
| Input: 8983 packets, 0 errors, 0 dropped, 0 overruns, 2 frame | Statistics for received packets: <br>• Total number. <br>• Number of erroneous packets. <br>• Number of dropped packets. <br>• Number of packets encountering queue overflow errors. <br>• Number of packets encountering frame queue errors. |

| Field | Description |
|---|---|
| Output: 431 packets, 0 errors, 0 dropped, 0 overruns, 0 carrier,  0 collisions, 1000 txqueuelen | Statistics for sent packets:<br>• Total number.<br>• Number of erroneous packets.<br>• Number of dropped packets.<br>• Number of packets encountering queue overflow errors.<br>• Number of packets encountering carrier failures.<br>• Number of packets with collision.<br>• Number of packets permitted by the queue. |
| Input bytes | Total number of received bytes. |
| Output bytes | Total number of sent bytes. |

# display ip routing-table

Use **display ip routing-table** to display IPv4 routing information.

## Syntax

**display ip routing-table**

## Views

Any view

## Examples

# Display IPv4 routing information.
```
<boot> display ip routing-table
Kernel IP routing table
Destination     Gateway          Genmask         Flags Metric Ref    Use Iface
192.168.116.0   *                255.255.255.0   U     0      0        0 m-eth0
default         192.168.116.1    0.0.0.0         UG    0      0        0 m-eth0
```

**Table 25 Command output**

| Field | Description |
|---|---|
| Kernel IP routing table | IPv4 routing information. |
| Destination | Destination address. For the default route, the value of this field is **default**. |
| Gateway | Gateway address. If no gateway is needed, the value of this field is an asterisk (**\***). |
| Genmask | Subnet mask. For the default route, the value of this field is 0.0.0.0. |
| Flags | Flags:<br>• **A**—The route was learned from a route advertisement.<br>• **C**—The route is a cached route used to fast forward packets.<br>• **D**—The route is the default route learned through neighbor discovery.<br>• **G**—The route is a gateway route.<br>• **H**—The route is a host route.<br>• **U**—The route can be used. |
| Metric | Cost of the route. |

| Field | Description |
|---|---|
| Ref | Number of times the route has been referenced by other route entries. |
| Use | Number of times the route has been matched. |
| Iface | Outbound interface. |

# display ipv6 routing-table

Use **display ipv6 routing-table** to display IPv6 routing information.

## Syntax

**display ipv6 routing-table**

## Views

Any view

## Examples

# Display IPv6 routing information.

```
<boot> display ipv6 routing-table
Kernel IPv6 routing table
Destination                               Next Hop
    Flags Metric Ref     Use Iface
::1/128                                    ::
    U      0       0         1 lo
FE80::201:2FF:FE03:406/128                 ::
    U      0       0         1 lo
FE80::/64                                  ::
    U     256     0         0 m-eth0
FF02::1:2/128                              FF02::1:2
    UC     0     2888        0 m-eth0
FF00::/8                                   ::
    U     256     0         0 m-eth0
```

### Table 26 Command output

| Field | Description |
|---|---|
| Kernel IPv6 routing table | IPv6 routing information. |
| Flags | Flags:<br>• **A**—The route was learned from a route advertisement.<br>• **C**—The route is a cached route used to fast forward packets.<br>• **D**—The route is the default route learned through neighbor discovery.<br>• **G**—The route is a gateway route.<br>• **H**—The route is a host route.<br>• **U**—The route can be used. |
| Metric | Cost of the route. |
| Ref | Number of times the route has been referenced by other route entries. |

| Field | Description |
|-------|-------------|
| Use | Number of times the route has been matched. |
| Iface | Outbound interface. If it is a loopback interface, the value of this field is **lo**. |

# display version

Use **display version** to display the version information of the boot image.

## Syntax

**display version**

## Views

Any view

## Examples

# Display the version information of the boot image.

```
<boot> display version
…
```

# format

Use **format** to format a storage medium.

## Syntax

**format** *storage-medium*

## Views

User view

## Parameters

*storage-medium*: Specifies the name of a storage medium.

The following matrix shows the support of MSR routers for the flash memory and CF card:

| Hardware | Flash memory compatibility | CF card compatibility |
|----------|----------------------------|-----------------------|
| MSR1000 | Yes | No |
| MSR2000 | Yes | No |
| MSR3000 | No | Yes |
| MSR4000 | No | Yes |

## Usage guidelines

Use the **format** command with caution. This command permanently deletes all files and directories from a storage medium, including the startup boot image and startup configuration files. The deleted files and directories cannot be restored. Without a boot image, the device cannot reboot.

## Examples

# Format the flash memory.

```
<boot> format flash:
All data on flash: will be lost, continue?[Y/N]:y
Formatting flash:… Done.
```

# ftp

Use **ftp** to access a remote FTP server.

## Syntax

**ftp** { *server-ipv4-address* | **ipv6** *server-ipv6-address* } **user** *username* **password** *password* { **get** *remote-file local-file* | **put** *local-file remote-file* }

## Views

User view

## Parameters

*server-ipv4-address*: Specifies the IPv4 address of the FTP server.

*server-ipv6-address*: Specifies the IPv6 address of the FTP server.

**user** *username*: Specifies the login username, a case-sensitive string of 1 to 15 characters.

**password** *password*: Specifies the login password, a case-sensitive string of 1 to 15 characters.

**get** *remote-file local-file*: Downloads a file from the FTP server. The *remote-file* argument indicates the file to be downloaded. The *local-file* argument indicates the name for the downloaded file.

**put** *local-file remote-file*: Uploads a file to the FTP server. The *local-file* argument indicates the file to be uploaded. The *remote-file* argument indicates the name for the uploaded file.

## Usage guidelines

If the traffic is heavy and the file transfer speed is low, you can press **Ctrl+C** to abort the transfer and try again later.

## Examples

# Log in to FTP server 192.168.1.100 by using the username **test** and password **123**. Download the **111.txt** file and save it to a local file named **222.txt**.

```
<boot> ftp 192.168.1.100 user test password 123 get 111.txt flash:/222.txt
```

# install load

Use **install load** to load a system image and start the Comware system.

## Syntax

**install load** *system-package*

## Views

User view

## Parameters

*system-package*: Specifies the name of the system image, a case-insensitive string of 1 to 63 characters. This file must be saved in the root directory of the storage medium on the device, using the extension .bin. The file name must indicate the storage medium, for example, flash:/startup-system.bin. (On an MSR1000, MSR2000 or MSR3000.)

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*system-package*: Specifies the name of the system image, a case-insensitive string of 1 to 63 characters. This file must be saved in the root directory of the current MPU's storage medium, with the extension .bin. The file name must indicate the storage medium and cannot contain slot information, for example, cfa0:/startup-system.bin. (On an MSR4000.)

## Usage guidelines

When you execute this command, the system modifies the main startup software image set to include only the boot image and system image so the device can reboot correctly.

After the Comware system is started, you can load feature and patch images. For more information, see the chapters about software upgrade and ISSU in *Fundamentals Configuration Guide*.

## Examples

# Load a system image and start the Comware system.

```
<boot> install load flash:/system.bin
Check package flash:/system.bin ...
Extracting package ...

Loading...
System application is starting...
Set bootargs.
CPIO Length: 0x96e7d8.
 cpio=0x96e7d8@0x13000000
CPIO Length: 0x96e7d8.
Starting application at 0x02000000 ..HA_Register OK, ulModuleID = 252772352, ulS
ubID = 6.HA_Register OK, ulModuleID = 254803968, ulSubID = 0.HA_Register OK, ulM
oduleID = 252706816, ulSubID = 0.HA_Register OK, ulModuleID = 255983616, ulSubID
 = 2.HA_Register OK, ulModuleID = 256442368, ulSubID = 0.HA daemon start as 1 (b
uild Jul 29 2011 11:50:56).
System service initialization completed, cost 28 seconds.
Autorun service initialization completed, cost 5 seconds.
Ondemand service initialization completed, cost 30 seconds.
Line con1 is available.


Press ENTER to get started.
```

# interface m-eth0

Use **interface m-eth0** to enter management Ethernet port view.

## Syntax

**interface m-eth0**

## Views

System view

## Usage guidelines

In management Ethernet port view, you can assign an IP address to the port and specify a gateway.

## Examples

# Enter management Ethernet port view.

```
<boot> system-view
[boot] interface m-eth0
[boot-m-eth0]
```

## Related commands

**quit**

# ip address

Use **ip address** to assign an IPv4 address to the management Ethernet port.

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

## Syntax

**ip address** *ip-address* { *mask-length* | *mask* }

**undo ip address**

## Default

The management Ethernet port has no IPv4 address.

## Views

Management Ethernet port view

## Parameters

*ip-address*: Specifies an IPv4 address in dotted decimal notation.

*mask-length*: Specifies the length of the subnet mask, in the range of 1 to 31.

*mask*: Specifies the subnet mask in dotted decimal notation.

## Usage guidelines

The management Ethernet port can have only one IPv4 address. If you execute this command multiple times, the most recent configuration takes effect.

When the management Ethernet port is manually shut down, assigning it an IPv4 address or removing its IPv4 address activates it at the same time.

The IP address assigned to the management Ethernet port must be different from the IP addresses of the other devices on the network.

## Examples

# Assign IPv4 address 192.168.1.1/24 to the management Ethernet port.

```
<boot> system-view
[boot] interface m-eth0
[boot-m-eth0] ip address 192.168.1.1 24
```

# ip gateway

Use **ip gateway** to specify an IPv4 gateway for the management Ethernet port.

Use **undo ip gateway** to restore the default.

**ip gateway** *ip-address*

**undo ip gateway**

## Default

The management Ethernet port has no IPv4 gateway configured.

## Views

Management Ethernet port view

## Parameters

*ip-address*: Specifies an IPv4 gateway address in dotted decimal notation.

## Usage guidelines

When the device needs to communicate with a device on a remote IPv4 network, you must specify an IPv4 gateway for the management Ethernet port.

If you execute this command multiple times, the most recent configuration takes effect.

Changing or removing the IPv4 address of the management Ethernet port removes the port's IPv4 gateway configuration.

## Examples

# Configure the management Ethernet port to use IPv4 gateway 192.168.1.5.

```
<boot> system-view
[boot] interface m-eth0
[boot-m-eth0] ip gateway 192.168.1.5
```

# ipv6 address

Use **ipv6 address** to assign an IPv6 address to the management Ethernet port.

Use **undo ipv6 address** to restore the default.

## Syntax

**ipv6 address** *ipv6-address prefix-length*

**undo ipv6 address**

## Default

The management Ethernet port has no IPv6 address.

## Views

Management Ethernet port view

## Parameters

*ipv6-address*: Specifies an IPv6 address.

*prefix-length*: Specifies a prefix length in the range of 1 to 128.

## Usage guidelines

The management Ethernet port can have only one IPv6 address. If you execute this command multiple times, the most recent configuration takes effect.

When the management Ethernet port is manually shut down, assigning it an IPv6 address or removing its IPv6 address activates it at the same time.

## Examples

# Assign IPv6 address 2001::1/64 to the management Ethernet port.

```
<boot> system-view
[boot] interface m-eth0
[boot-m-eth0] ipv6 address 2001::1 64
```

# ipv6 gateway

Use **ipv6 gateway** to specify an IPv6 gateway for the management Ethernet port.

Use **undo ipv6 gateway** to restore the default.

## Syntax

**ipv6 gateway** *link-local*

**undo ipv6 gateway**

## Default

The management Ethernet port has no IPv6 gateway configured.

## Views

Management Ethernet port view

## Parameters

*link-local*: Specifies the Link-local address of an IPv6 gateway.

## Usage guidelines

When the device needs to communicate with a device on a remote IPv6 network, you must specify an IPv6 gateway for the management Ethernet port.

If you execute this command multiple times, the most recent configuration takes effect.

Changing or removing the IPv6 address of the management Ethernet port removes the port's IPv6 gateway configuration.

## Examples

# Configure the management Ethernet port to use FE80::BAAF:67FF:FE27:DCD0.

```
<boot> system-view
[boot] interface m-eth0
[boot-m-eth0] ipv6 gateway fe80::baaf:67ff:fe27:dcd0
```

# mkdir

Use **mkdir** to create a directory on a storage medium.

## Syntax

**mkdir** *directory*

## Views

User view

## Parameters

*directory*: Specifies a directory name.

## Usage guidelines

The path must already exist. For example, to create the **flash:/test/mytest** directory, the directory **test** must already exist on the flash memory.

The name for the new directory must be unique in the upper-level directory.

## Examples

# Create a directory named **test** in the current directory.

```
<boot> mkdir flash:/test
Directory flash:/test created.
```

# Create a directory named **subtest** in the **test** directory.

```
<boot> mkdir flash:/test/subtest
Directory flash:/test/subtest created.
```

## Related commands

- **dir**
- **rmdir**

# more

Use **more** to display the contents of a file.

## Syntax

**more** *file-url*

## Views

User view

## Parameters

*file-url*: Specifies a file name.

## Examples

# Display the contents of file **test.txt**.

```
<boot> more flash:/test.txt
Have a nice day.
```

# move

Use **move** to move a file.

## Syntax

**move** *fileurl-source fileurl-dest*

## Views

User view

## Parameters

*fileurl-source*: Specifies the name of the file to be moved, a case-insensitive string of 1 to 63 characters.

*fileurl-dest*: Specifies the name of the destination file or directory, a case-insensitive string of 1 to 63 characters.

### Usage guidelines

If you specify a non-existent destination file name, the command moves the source file to the destination directory and renames it.

If you specify an existing destination file name, the system prompts whether or not to overwrite the existing file.

### Examples

# Move the **config.cfg** file to the **flash:/002** directory.

```
<boot>move flash:/config.cfg flash:/test/
Move flash:/config.cfg to flash:/test/config.cfg?[Y/N]:y
<boot> dir flash:/test
Directory of flash:/test
     0      -rw-      77065  Oct 20 1939 06:15:02     test.mdb

61440 KB total (11108 KB free)
```

# ping

Use **ping** to check the connectivity to an IPv4 address.

### Syntax

**ping** [ **-c** *count* | **-s** *size* ] * *ip-address*

### Views

Any view

### Parameters

**-c** *count*: Specifies the number of ICMP echo requests to send, in the range of 1 to 2147483647. The default is 5.

**-s** *size*: Specifies the length (in bytes) of each ICMP echo request, in the range of 20 to 8100. The default is 56.

*ip-address*: Specifies the IPv4 address of the destination in dotted decimal notation.

### Usage guidelines

When you execute the **ping** command, the device sends ICMP echo requests to the destination. You can press **Ctrl+C** to abort the ping operation.

### Examples

# Check the connectivity to the destination 1.2.1.1.

```
<boot> ping 1.2.1.1
PING 1.2.1.1 (1.2.1.1): 56 data bytes
56 bytes from 1.2.1.1: seq=0 ttl=128 time=2.243 ms
56 bytes from 1.2.1.1: seq=1 ttl=128 time=0.717 ms
56 bytes from 1.2.1.1: seq=2 ttl=128 time=0.891 ms
56 bytes from 1.2.1.1: seq=3 ttl=128 time=0.745 ms
56 bytes from 1.2.1.1: seq=4 ttl=128 time=0.911 ms
--- 1.2.1.1 ping statistics ---
```

```
5 packets transmitted, 5 packets received, 0% packet loss
round-trip min/avg/max = 0.717/1.101/2.243 ms
```

**Table 27 Command output**

| Field | description |
|---|---|
| PING 1.2.1.1 (1.2.1.1) | Checking the connectivity to the device at 1.2.1.1. |
| 56 data bytes | Number of data bytes in each ICMP echo request. |
| 56 bytes from 1.2.1.1: seq=0 ttl=128 time=2.243 ms | Received an ICMP reply from the device at 1.2.1.1.<br><br>Fields of the reply:<br>• **bytes**—Number of data bytes in the ICMP reply.<br>• **seq**—Sequence number of the reply. You can examine the sequence numbers of replies to determine whether packets are missing, disordered, or duplicated.<br>• **ttl**—TTL value in the ICMP reply.<br>• **time**—Response time. |
| -- 1.2.1.1 ping statistics -- | Statistics for packets sent and received during the ping operation. |
| 5 packets transmitted | Number of ICMP echo requests sent. |
| 5 packets received | Number of ICMP echo replies received. |
| 0% packet loss | Percentage of echo requests that failed to be echoed back. |
| round-trip min/avg/max = 0.717/1.101/2.243 ms | Minimum/average/maximum response time, in milliseconds. |

# ping ipv6

Use **ping ipv6** to check the connectivity to an IPv6 address.

## Syntax

**ping ipv6** [ **-c** *count* | **-s** *size* ] * *ipv6-address*

## Views

Any view

## Parameters

**-c** *count*: Specifies the number of ICMPv6 echo requests to send, in the range of 1 to 2147483647. The default is 5.

**-s** *size*: Specifies the length (in bytes) of each ICMPv6 echo request, in the range of 20 to 8100. The default is 56.

*Ipv6-address*: Specifies the IPv6 address of the destination.

## Usage guidelines

When you execute the **ping ipv6** command, the device sends ICMPv6 echo requests to the destination. You can press **Ctrl+C** to abort the ping operation.

## Examples

# Check the connectivity to the destination 2001::2.

```
<boot> ping ipv6 2001::2
```

```
ping ipv6 2001::2
PING 2001::2 (2001::2): 56 data bytes
56 bytes from 2001::2: seq=0 ttl=64 time=5.420 ms
56 bytes from 2001::2: seq=1 ttl=64 time=1.140 ms
56 bytes from 2001::2: seq=2 ttl=64 time=2.027 ms
56 bytes from 2001::2: seq=3 ttl=64 time=0.887 ms
56 bytes from 2001::2: seq=4 ttl=64 time=0.791 ms
--- 2001::2 ping statistics ---
5 packets transmitted, 5 packets received, 0% packet loss
round-trip min/avg/max = 0.791/2.053/5.420 ms
```

For more information about the fields, see Table 27.

# pwd

Use **pwd** to display the current path.

## Syntax

pwd

## Views

User view

## Examples

# Display the current path.
```
<boot> pwd
flash:
```

# quit

Use **quit** to return to the upper level view.

## Syntax

**quit**

## Views

System view, management Ethernet port view

## Examples

# Return from management Ethernet port view to user view.
```
[boot-m-eth0] quit
[boot] quit
<boot>
```

# reboot

Use the **reboot** command to reboot the device. (On an MSR1000, MSR2000 or MSR3000.)

Use the **reboot** command to reboot the current MPU. (On an MSR4000.)

## Syntax

**reboot**

## Views

User view

## Examples

# On an MSR1000, MSR2000 or MSR3000, reboot the device.

```
<boot> reboot
```

# On an MSR4000, reboot the current MPU.

```
<boot> reboot
```

# reset ssh public-key

Use **reset ssh public-key** to delete all server public keys saved on the device.

## Syntax

**reset ssh public-key**

## Views

User view

## Usage guidelines

The first time you use the **ssh2** command to connect to an SSH server, the device saves the server's public key locally. The device can then use the public key to authenticate the server when you connect to the server from the device again. If the server changes its public key, the public keys will not match anymore and you cannot connect to the server. To solve this problem, use this command to delete all server public keys saved on the device.

## Examples

# Delete all server public keys saved on the device.

```
<boot> ssh2 192.168.1.59
login as:client001
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
@    WARNING: REMOTE HOST IDENTIFICATION HAS CHANGED!     @
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
IT IS POSSIBLE THAT SOMEONE IS DOING SOMETHING NASTY!
Someone could be eavesdropping on you right now (man-in-the-middle attack)!
It is also possible that a host key has just been changed.
The fingerprint for the RSA key sent by the remote host is
83:2d:b6:90:4a:1b:0e:c1:ea:af:09:3a:65:09:8a:b3.
Please contact your system administrator.
RSA host key for 192.168.1.59 has changed and you have requested strict checking
.
Host key verification failed.
<boot> reset ssh public-key
<boot> ssh2 192.168.1.59
login as:client001
The authenticity of host '192.168.1.59 (192.168.1.59)' can't be established.
RSA key fingerprint is 83:2d:b6:90:4a:1b:0e:c1:ea:af:09:3a:65:09:8a:b3.
```

```
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '192.168.1.59' (RSA) to the list of known hosts.
client001@192.168.1.59's password:
******************************************************************************
* Copyright (c) 2010-2014 Hewlett-Packard Development Company, L.P.          *
* Without the owner's prior written consent,                                 *
* no decompiling or reverse-engineering shall be allowed.                    *
******************************************************************************

<Sysname>
```

# rmdir

Use **rmdir** to delete an existing directory.

## Syntax

**rmdir** *directory*

## Views

User view

## Parameters

*directory*: Specifies the name of the directory to be deleted.

## Usage guidelines

To delete a directory, first delete the files and subdirectories in the directory. To delete files, use the **delete** command.

## Examples

# Delete the **mydir** directory.

```
<boot> rmdir flash:/mydir
Remove directory flash:/mydir?[Y/N]:y
Directory flash:/1 removed.
```

## Related commands

- **delete**
- **dir**
- **mkdir**

# shutdown

Use **shutdown** to shut down the management Ethernet port.

Use **undo shutdown** to bring up the management Ethernet port.

## Syntax

**shutdown**

**undo shutdown**

## Default

The management Ethernet port is up.

## Views

Management Ethernet port view

## Usage guidelines

When the management Ethernet port is not operating correctly, you can shut it down and then bring it up.

## Examples

# Shut down the management Ethernet port.

```
<boot> system-view
[boot] interface m-eth0
[boot-m-eth0] shutdown
```

# Bring up the management Ethernet port.

```
[boot-m-eth0] undo shutdown
```

# ssh2

Use **ssh2** to log in to an SSH server.

## Syntax

**ssh2** { *server-ipv4-address* | **ipv6** *server-ipv6-address* }

## Views

User view

## Parameters

*server-ipv4-address*: Specifies the IPv4 address of the SSH server in dotted decimal notation.

**ipv6** *server-ipv6-address*: Specifies the IPv6 address of the SSH server.

## Usage guidelines

If the SSH server does not respond, you can press **Ctrl+C** to abort the login attempt and try again later.

## Examples

# Use SSH to connect to SSH server 192.168.1.59 for the first time.

```
<boot> ssh2 192.168.1.59
login as:client001
The authenticity of host '192.168.1.59 (192.168.1.59)' can't be established.
RSA key fingerprint is 3d:ee:1f:f9:81:be:4f:aa:42:88:1c:ab:81:4e:95:6f.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '192.168.1.59' (RSA) to the list of known hosts.
client001@192.168.1.59's password:
******************************************************************************
* Copyright (c) 2010-2014 Hewlett-Packard Development Company, L.P.          *
* Without the owner's prior written consent,                                 *
* no decompiling or reverse-engineering shall be allowed.                    *
******************************************************************************
```

```
<Sysname>
```

# Use SSH to connect to SSH server 192.168.1.59 for the second time.

```
<boot> ssh2 192.168.1.59
login as:client001
client001@192.168.1.59's password:

*****************************************************************************
* Copyright (c) 2010-2014 Hewlett-Packard Development Company, L.P.        *
* Without the owner's prior written consent,                              *
* no decompiling or reverse-engineering shall be allowed.                 *
*****************************************************************************

<Sysname>
```

# system-view

Use **system-view** to enter system view from user view.

## Syntax

system-view

## Views

User view

## Usage guidelines

After the device enters emergency shell mode, you are placed in user view.

## Examples

# Enter system view from user view.

```
<boot> system-view
[boot]
```

## Related commands

**quit**

# telnet

Use **telnet** to log in to a Telnet server.

## Syntax

**telnet** { *server-ipv4-address* | **ipv6** *server-ipv6-address* }

## Views

User view

## Parameters

*server-ipv4-address*: Specifies the IPv4 address of the Telnet server in dotted decimal notation.

*server-ipv6-address*: Specifies the IPv6 address of the Telnet server.

## Usage guidelines

If the Telnet server does not respond, you can press **Ctrl+K** to abort the login attempt and try again later.

## Examples

\# Telnet to Telnet server 192.168.100.1.

```
<boot> telnet 192.168.100.1
```

# tftp

Use **tftp** to log in to a TFTP server.

## Syntax

**tftp** *server-ipv4-address* { **get** *remote-file local-file* | **put** *local-file remote-file* }

**tftp ipv6** *server-ipv6-address* { **get** *remote-file local-file* | **put** *local-file remote-file* }

## Views

User view

## Parameters

*server-ipv4-address*: Specifies the IPv4 address of the TFTP server in dotted decimal notation.

*server-ipv6-address*: Specifies the IPv6 address of the TFTP server.

**get** *remote-file local-file*: Downloads a file from the TFTP server. The *remote-file* argument indicates the file to be downloaded. The *local-file* argument indicates the name for the downloaded file.

**put** *local-file remote-file*: Uploads a file to the TFTP server. The *local-file* argument indicates the file to be uploaded. The *remote-file* argument indicates the name for the uploaded file.

## Usage guidelines

If the traffic is heavy and the file transfer speed is low, you can press **Ctrl+C** to abort the transfer and try again later.

## Examples

\# Log in to TFTP server 192.168.1.100, download the **111.txt** file, and save it to a local file named **222.txt**.

```
<boot> tftp 192.168.1.100 get 111.txt flash:/222.txt
```

\# Upload the startup configuration file named **startup.cfg** to TFTP server 192.168.1.100.

```
<boot> tftp 192.168.1.100 put flash:/startup.cfg startup.cfg
```

# Automatic configuration commands

## autodeploy udisk enable

Use **autodeploy udisk enable** to enable USB-based automatic configuration.

Use **undo autodeploy udisk enable** to disable USB-based automatic configuration.

### Syntax

**autodeploy udisk enable**

**undo autodeploy udisk enable**

### Default

USB-based automatic configuration is enabled.

### Views

System view

### Predefined user roles

network-admin

### Usage guidelines

The USB disk for automatic configuration can have multiple configuration files. A configuration file can be named in the *Device serial number*.**cfg** format or use the name **autodeploy.cfg**.

To start USB-based automatic configuration for a device, you must connect the USB disk to the device before powering on the device. If the USB disk has a configuration file named by the device's serial number, the device copies the configuration file to its default storage medium and specifies it as the next-startup configuration file.

If the automatic configuration fails, the device uses the next-startup configuration file on its default storage medium. If the default storage medium does not have a next-startup configuration file, the device starts up without loading a configuration file.

### Examples

# Disable USB-based automatic configuration.

```
<Sysname> system-view
[Sysname] undo autodeploy udisk enable
```

# Device management commands

In this chapter, "MSR1000" refers to MSR1002-4. "MSR2000" refers to MSR2003, MSR2004-24, MSR2004-48. "MSR3000" collectively refers to MSR3012, MSR3024, MSR3044, MSR3064. "MSR4000" collectively refers to MSR4060 and MSR4080.

## card-mode

Use **card-mode** to set the operating mode of an interface card.

### Syntax

MSR1000/MSR2000/MSR3000:

**card-mode slot** *slot-number mode-name*

MSR4000:

**card-mode slot** *slot-number* **subslot** *subslot-number mode-name*

### Views

System view

### Predefined user roles

network-admin

### Parameters

**slot** *slot-number*: Specifies a subcard by its slot number. (On an MSR1000, MSR2000 or MSR3000.)

**slot** *slot-number*: Specifies a card by its slot number. (on an MSR4000.)

**subslot** *subslot-number*: Specifies a subcard by its subslot number.

*mode-name*: Specifies an operating mode. This argument might take one of the following values, depending on the interface card type:

- **e**: Specifies the E mode, including E1 and E3. If you specify this keyword, all interfaces on the interface card operate as CPOS E3-E1 interfaces. For more information, see *Interface Configuration Guide*.
- **t**: Specifies the T mode, including T1 and T3. If you specify this keyword, all interfaces on the interface card operate as CPOS T3-T1 interfaces. For more information, see *Interface Configuration Guide*.
- **e1**: Specifies the E1 mode. If you specify this keyword, all interfaces on the interface card operate as CPOS E1 interfaces. For more information, see *Interface Configuration Guide*.
- **t1**: Specifies the T1 mode. If you specify this keyword, all interfaces on the interface card operate as CPOS T1 interfaces. For more information, see *Interface Configuration Guide*.
- **e3**: Specifies the E3 mode. If you specify this keyword, all interfaces on the interface card operate as CPOS E3 interfaces. For more information, see *Interface Configuration Guide*.
- **t3**: Specifies the T3 mode. If you specify this keyword, all interfaces on the interface card operate as CPOS T3 interfaces. For more information, see *Interface Configuration Guide*.

- **pos**: Specifies the POS mode. If you specify this keyword, all interfaces on the interface card operate as POS interfaces. For more information, see *Interface Configuration Guide*.

- **e-cpos**: Specifies the E-CPOS mode. If you specify this keyword, all interfaces on the interface card operate as 2.5 Gbps CPOS interfaces. For more information, see *Interface Configuration Guide*.

- **oc-3**: Specifies the OC-3c/STM-1c mode (155 Mbps). If you specify this keyword, all interfaces on the interface card operate as 155 Mbps CPOS interfaces. For more information, see *Interface Configuration Guide*.

- **oc-12**: Specifies the OC-12c/STM-4c mode (622 Mbps). If you specify this keyword, all interfaces on the interface card operate as 622 Mbps CPOS interfaces. For more information, see *Interface Configuration Guide*.

- **ipsec**: Specifies the IPsec mode.

- **ssl**: Specifies the SSL mode.

- **atm**: Specifies the ATM mode. If you specify this keyword, all interfaces on the interface card operate as ATM interfaces. For more information, see *Interface Configuration Guide*.

- **auto**: Specifies the auto-negotiation mode. If you specify this keyword, the interface card operates in ATM or EFM mode, depending on the negotiation result.

- **efm**: Specifies the EFM mode. If you specify this keyword, all interfaces on the interface card operate as EFM interfaces. For more information, see *Interface Configuration Guide*.

## Usage guidelines

This command takes effect immediately.

## Examples

# On an MSR1000, MSR2000 or MSR3000, set the operating mode to E3 for the interface card in slot 2.

```
<Sysname> system-view
[Sysname] card-mode slot 2 e3
Please reboot or hot-swap the board or card (if supported) to make the configuration take
effect.
```

# On an MSR4000, set the operating mode to E3 for the subcard in subslot 1 of interface card 2.

```
<Sysname> system-view
[Sysname] card-mode slot 2 subslot 1 e3
Please reboot or hot-swap the board or card (if supported) to make the configuration take
effect.
```

# Set the operating mode to EFM for the ATM interface card in slot 0.

```
<Sysname> system-view
[Sysname] card-mode slot 0 efm
Please reboot or hot-swap the board or card (if supported) to make the configuration take
effect.
```

# clock datetime

Use **clock datetime** to set the UTC time.

## Syntax

**clock datetime** *time date*

## Views

User view

## Predefined user roles

network-admin

## Parameters

*time*: Specifies a time in the format *hh:mm:ss*. The *hh* value is in the range of 0 to 23. The *mm* value is in the range of 0 to 59. The *ss* value is in the range of 0 to 59. The leading zero in a segment can be omitted. If the seconds segment is 0 (*hh:mm*:00), you can omit it. If both the minutes and seconds segments are 0 (*hh*:00:00), you can omit both of the segments. For example, to specify 08:00:00, you can enter 8.

*date*: Specifies a date in the format *MM/DD/YYYY* or *YYYY/MM/DD*. The *YYYY* value is in the range of 2000 to 2035. The *MM* value is in the range of 1 to 12. The value range for *DD* varies by month.

## Usage guidelines

When the system time source is the local system time, the UTC time determines the system time together with the local time zone and daylight saving time. You can use the **display clock** command to view the system time.

A correct system time setting is essential to network management and communication. Set the system time correctly or use NTP to synchronize your device with a trusted time source before you run it on the network.

## Examples

# Set the UTC time to 08:08:08 01/01/2013.
```
<Sysname> clock datetime 8:8:8 1/1/2013
```
# Set the UTC time to 08:10:00 01/01/2013.
```
<Sysname> clock datetime 8:10 2013/1/1
```

## Related commands

- **clock protocol**
- **clock summer-time**
- **clock timezone**
- **display clock**

# clock protocol

Use **clock protocol** to specify the system time source.

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

## Syntax

**clock protocol** { **none** | **ntp** }

**undo clock protocol**

## Views

System view

## Predefined user roles

network-admin

## Parameters

**none**: Uses the local system time that is configured by using the **clock datetime**, **clock timezone**, and **clock summer-time** commands.

**ntp**: Uses the NTP time source. When the device uses the NTP time source, you cannot change the system time manually. For more information about NTP, see *Network Management and Monitoring Configuration Guide*.

## Usage guidelines

If you configure this command multiple times, the most recent configuration takes effect.

## Examples

\# Configure the device to use the local system time.

```
<Sysname> system-view
[Sysname] clock protocol none
```

# clock summer-time

Use **clock summer-time** to configure the device to use daylight saving time during a specific period of time.

Use **undo clock summer-time** to cancel the configuration.

## Syntax

**clock summer-time** *name start-time start-date end-time end-date add-time*

**undo clock summer-time**

## Default

Daylight saving time is disabled.

## Views

System view

## Predefined user roles

network-admin

## Parameters

*name*: Specifies a name for the daylight saving time schedule, a case-sensitive string of 1 to 32 characters.

*start-time*: Specifies the start time in the format *hh:mm:ss*. The *hh* value is in the range of 0 to 23. The *mm* value is in the range of 0 to 59. The *ss* value is in the range of 0 to 59. The leading zero in a segment can be omitted. If the seconds segment is 0 (*hh:mm*:00), you can omit it. If both the minutes and seconds segments are 0 (*hh*:00:00), you can omit both of the segments. For example, to specify 08:00:00, you can enter 8.

*start-date*: Specifies the start date in one of the following formats:

- *MM/DD*. The *MM* value is in the range of 1 to 12. The value range for *DD* varies by month.
- *month week date*, where:
  - *month*—Takes **January**, **February**, **March**, **April**, **May**, **June**, **July**, **August**, **September**, **October**, **November** or **December**.
  - *week*—Represents week of the month. It takes **first**, **second**, **third**, **fourth**, **fifth**, or **last**.

- *day*—Takes **Sunday**, **Monday**, **Tuesday**, **Wednesday**, **Thursday**, **Friday**, or **Saturday**.

*end-time*: Specifies the end time in the format *hh:mm:ss*. The *hh* value is in the range of 0 to 23. The *mm* value is in the range of 0 to 59. The *ss* value is in the range of 0 to 59. The leading zero in a segment can be omitted. If the seconds segment is 0 (*hh*:*mm*:00), you can omit it. If both the minutes and seconds segments are 0 (*hh*:00:00), you can omit both of the segments. For example, to specify 08:00:00, you can enter 8.

*end-date*: Specifies the end date in one of the following formats:

- *MM/DD*. The *MM* value is in the range of 1 to 12. The value range for *DD* varies by month.
- *month week date*, where:
  - *month*—Takes **January**, **February**, **March**, **April**, **May**, **June**, **July**, **August**, **September**, **October**, **November** or **December**.
  - *week*—Represents week of the month. It takes **first**, **second**, **third**, **fourth**, **fifth**, or **last**.
  - *day*—Takes **Sunday**, **Monday**, **Tuesday**, **Wednesday**, **Thursday**, **Friday**, or **Saturday**.

*add-time*: Specifies the time to be added to the standard time, in the format *hh:mm:ss*. The *hh* value is in the range of 0 to 23. The *mm* value is in the range of 0 to 59. The *ss* value is in the range of 0 to 59. The leading zero in a segment can be omitted. If the seconds segment is 0 (*hh*:*mm*:00), you can omit it. If both the minutes and seconds segments are 0 (*hh*:00:00), you can omit both of the segments. For example, to specify 08:00:00, you can enter 8.

## Usage guidelines

When the system time source is the local system time, the daylight saving time determines the system time together with the UTC time and local time zone. You can use the **display clock** command to view the system time.

A correct system time setting is essential to network management and communication. Set the system time correctly or use NTP to synchronize your device with a trusted time source before you run it on the network.

## Examples

# Set the system time ahead 1 hour for the period between 06:00:00 on 08/01 and 06:00:00 on 09/01.

```
<Sysname> system-view
[Sysname] clock summer-time PDT 6 08/01 6 09/01 1
```

## Related commands

- **clock datetime**
- **clock timezone**
- **display clock**

# clock timezone

Use **clock timezone** to set the local time zone.

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

## Syntax

**clock timezone** *zone-name* { **add** | **minus** } *zone-offset*

**undo clock timezone**

## Default

The local time zone is the UTC time zone.

## Views

System view

## Predefined user roles

network-admin

## Parameters

*zone-name*: Specifies a time zone by its name, a case-sensitive string of 1 to 32 characters.

**add**: Adds an offset to the UTC time.

**minus**: Decreases the UTC time by an offset.

*zone-offset*: Specifies an offset to the UTC time, in the format *hh:mm:ss*. The *hh* value is in the range of 0 to 23. The *mm* value is in the range of 0 to 59. The *ss* value is in the range of 0 to 59. The leading zero in a segment can be omitted. If the seconds segment is 0 (*hh:mm*:00), you can omit it. If both the minutes and seconds segments are 0 (*hh*:00:00), you can omit both of the segments. For example, to specify 08:00:00, you can enter 8.

## Usage guidelines

When the system time source is the local system time, the local time zone determines the system time together with the UTC time and daylight saving time. You can use the **display clock** command to view the system time.

A correct system time setting is essential to network management and communication. Set the system time correctly or use NTP to synchronize your device with a trusted time source before you run it on the network.

## Examples

# Set the name of the local time zone to **Z5**, and add 5 hours to the UTC time.

```
<Sysname> system-view
[Sysname] clock timezone Z5 add 5
```

## Related commands

- **clock datetime**
- **clock summer-time**
- **display clock**

# command

Use **command** to assign a command to a job.

Use **undo command** to revoke a command.

## Syntax

**command** *id command*

**undo command** *id*

## Default

No command is assigned to a job.

## Views

Job view

## Predefined user roles

network-admin

## Parameters

*id*: Specifies a command ID in the range of 0 to 4294967295.

*command*: Specifies the command to be assigned to the job.

## Usage guidelines

A job can have multiple commands. Commands in a job are uniquely identified by their IDs. A command with a smaller ID is executed earlier.

If a command uses the ID of an existing command, the existing command is replaced.

A job cannot contain any of these commands: **telnet**, **ftp**, **ssh2**, or **monitor process**.

The system does not check the validity of the *command* argument. You must make sure the command is supported by the device, is input in the correct format, and uses valid values. Otherwise, the command cannot be executed automatically.

## Examples

# Assign commands to job **backupconfig** to back up configuration file **startup.cfg** to the TFTP server at 192.168.100.11.

```
<Sysname> system-view
[Sysname] scheduler job backupconfig
[Sysname-job-backupconfig] command 2 tftp 192.168.100.11 put flash:/startup.cfg
backup.cfg
```

## Related commands

**scheduler job**

# copyright-info enable

Use **copyright-info enable** to enable displaying the copyright statement.

Use **undo copyright-info enable** to disable displaying the copyright statement.

## Syntax

**copyright-info enable**

**undo copyright-info enable**

## Default

The copyright statement is displayed.

## Views

System view

## Predefined user roles

network-admin

## Examples

# Enable displaying the copyright statement.

```
<Sysname> system-view
[Sysname] copyright-info enable
```

• When a Telnet user logs in, the following statement appears:

```
******************************************************************************
* Copyright (c) 2010-2014 Hewlett-Packard Development Company, L.P.         *
* Without the owner's prior written consent,                               *
* no decompiling or reverse-engineering shall be allowed.                  *
******************************************************************************


<Sysname>
```

• When a console user quits user view, the following message appears:

```
******************************************************************************
* Copyright (c) 2010-2014 Hewlett-Packard Development Company, L.P.         *
* Without the owner's prior written consent,                               *
* no decompiling or reverse-engineering shall be allowed.                  *
******************************************************************************


User interface con0 is available.



Press ENTER to get started.
```

# Disable displaying the copyright statement.

```
<Sysname> system-view
[Sysname] undo copyright-info enable
```

• When a Telnet user logs in, the user view prompt appears:

```
<Sysname>
```

• When a console user quits user view, the following message appears:

```
User interface con0 is available.



Press ENTER to get started.
```

# display alarm

Use **display alarm** to display alarm information.

## Syntax

**display alarm** [ **slot** *slot-number* ]

## Views

Any view

### Predefined user roles

network-admin

network-operator

### Parameters

**slot** *slot-number*: Specifies the entire device. The value is always 0. (On an MSR1000, MSR2000 or MSR3000.)

**slot** *slot-number*: Specifies a card by its slot number. If you do not specify this option, the command displays the alarm information for all cards. (On an MSR4000.)

### Examples

# On an MSR1000, MSR2000 or MSR3000, display alarm information.

```
<Sysname> display alarm
Slot CPU Level   Info
0    0   ERROR   faulty
```

**Table 28 Command output**

| Field | Description |
|-------|-------------|
| Slot | If the alarm was generated by a card in a slot, the value of this field is a hyphen (-). Otherwise, the value of this field is 0. |
| Level | Alarm severity. Possible values include **ERROR**, **WARNING**, **NOTICE**, and **INFO**, in descending order. |
| Info | Detailed alarm information. |
| faulty | The card is starting up or is faulty. |

# On an MSR4000, display alarm information.

```
<Sysname> display alarm
Slot CPU Level   Info
2    0   ERROR   faulty
5    0   ERROR   faulty
8    1   ERROR   faulty
```

**Table 29 Command output**

| Field | Description |
|-------|-------------|
| Slot | Slot number of the card with an alarm. If the value is a hyphen (-), the alarm was generated by the chassis. (On an MSR4000.) |
| Level | Alarm severity. Possible values include **ERROR**, **WARNING**, **NOTICE**, and **INFO**, in descending order. |
| Info | Detailed alarm information. |
| faulty | The card is starting up or is faulty. |

# display clock

Use **display clock** to display the system time, date, local time zone, and daylight saving time.

**Syntax**

> **display clock**

**Views**

> Any view

**Predefined user roles**

> network-admin
>
> network-operator

**Examples**

> # Display the system time and date when the local time zone is not specified.
> ```
> <Sysname> display clock
> 10:09:00 UTC Fri 03/16/2013
> ```
>
> # Display the system time and date when the local time zone Z5 is specified.
> ```
> <Sysname> display clock
> 15:10:00 Z5 Fri 03/16/2013
> Time Zone : Z5 add 05:00:00
> ```
>
> # Display the system time and date when the local time zone Z5 and daylight saving time PDT are specified.
> ```
> <Sysname> display clock
> 15:11:00 Z5 Fri 03/16/2013
> Time Zone : Z5 add 05:00:00
> Summer Time : PDT 06:00:00 08/01 06:00:00 09/01 01:00:00
> ```

**Related commands**

- **clock datetime**
- **clock summer-time**
- **clock timezone**

# display copyright

> Use **display copyright** to display the copyright statement, including software and hardware copyright statements, and third-party software license agreements.

**Syntax**

> **display copyright**

**Views**

> Any view

**Predefined user roles**

> network-admin
>
> network-operator

**Examples**

> # Display the copyright statement.
> ```
> <Sysname> display copyright
> ```

# display cpu-usage

Use **display cpu-usage** to display the current CPU usage statistics.

## Syntax

MSR1000/MSR2000/MSR3000:

**display cpu-usage**

MSR4000:

**display cpu-usage** [ **slot** *slot-number* [ **cpu** *cpu-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 this option, the command displays the CPU usage statistics for all cards. (On an MSR4000.)

**cpu** *cpu-number*: Specifies a CPU by its number. If you do not specify this option, the command displays the CPU usage statistics for the default CPU. (On an MSR4000.)

## Usage guidelines

This command displays the average CPU usage values during the last 5-second, 1-minute, and 5-minute interval.

## Examples

\# On an MSR1000, MSR2000 or MSR3000, display the current CPU usage statistics.

```
<Sysname> display cpu-usage
Unit CPU usage:
       1% in last 5 seconds
       1% in last 1 minute
       1% in last 5 minutes
```

\# On an MSR4000, display the current CPU usage statistics.

```
<Sysname> display cpu-usage
Slot 0 CPU 0 CPU usage:
       1% in last 5 seconds
       0% in last 1 minute
       0% in last 5 minutes


Slot 1 CPU 0 CPU usage:
       1% in last 5 seconds
       1% in last 1 minute
       1% in last 5 minutes
```

Table 30 Command output

| Field | Description |
|---|---|
| Unit CPU usage | CPU usage statistics. (On an MSR1000, MSR2000 or MSR3000.) |
| 1% in last 5 seconds | Average CPU usage during the last 5 seconds. |
| 1% in last 1 minute | Average CPU usage during the last minute. |
| 1% in last 5 minutes | Average CPU usage during the last 5 minutes. |
| Slot x CPU y CPU usage | Usage statistics for CPU y of the card in slot x. (On an MSR4000.) |

# display cpu-usage configuration

Use **display cpu-usage configuration** to display CPU usage monitoring settings.

## Syntax

MSR1000/MSR2000/MSR3000:

**display cpu-usage configuration**

MSR4000:

**display cpu-usage configuration** [ **slot** *slot-number* [ **cpu** *cpu-number* ] ]

## Views

Any view

## Predefined user roles

network-admin

## Parameters

**slot** *slot-number*: Specifies a card by its slot number. If you do not specify this option, the command displays the CPU usage monitoring settings for the active MPU. (On an MSR4000.)

**cpu** *cpu-number*: Specifies a CPU by its number. If you do not specify this option, the command displays the CPU usage monitoring settings for the default CPU. (On an MSR4000.)

## Examples

# Display the CPU usage monitoring settings.
```
<Sysname> display cpu-usage configuration
CPU usage monitor is enabled.
Current monitor interval is 60 seconds.
```

## Related commands

- **monitor cpu-usage enable**
- **monitor cpu-usage interval**

# display cpu-usage history

Use **display cpu-usage history** to display the historical CPU usage statistics in a coordinate system.

## Syntax

MSR1000/MSR2000/MSR3000:

**display cpu-usage history** [ **job** *job-id* ]

MSR4000:

**display cpu-usage history** [ **job** *job-id* ] [ **slot** *slot-number* [ **cpu** *cpu-number* ] ]

## Views

Any view

## Predefined user roles

network-admin

network-operator

## Parameters

**job** *job-id*: Specifies a process by its ID. If you do not specify this option, the command displays the historical CPU usage statistics for the entire system, which is the sum of the historical CPU usage statistics for all processes in the system. To view the IDs and names of the running processes, use the **display process** command. For more information, see *Network Management and Monitoring Configuration Guide*.

**slot** *slot-number*: Specifies a card by its slot number. If you do not specify this option, the command displays the historical CPU usage statistics for the active MPU. (On an MSR4000.)

**cpu** *cpu-number*: Specifies a CPU by its number. If you do not specify this option, the command displays the historical CPU usage statistics for the default CPU. (On an MSR4000.)

## Usage guidelines

After CPU usage monitoring is enabled, the system regularly samples CPU usage and saves the samples to the history record buffer. This command displays the most recent 60 samples in a coordinate system as follows:

- The vertical axis represents the CPU usage. If a statistic is not a multiple of the usage step, it is rounded up or down to the closest multiple of the usage step, whichever is closer. For example, if the CPU usage step is 5%, the statistic 53% is rounded up to 55%, and the statistic 52% is rounded down to 50%.
- The horizontal axis represents the time.
- Consecutive pound signs (#) indicate the CPU usage at a specific time. The value on the vertical axis for the topmost pound sign at a specific time represents the CPU usage at that time.

## Examples

# Display the historical CPU usage statistics for the entire system.

```
<Sysname> display cpu-usage history
100%|
 95%|
 90%|
 85%|
 80%|
 75%|
 70%|
 65%|
 60%|
 55%|
 50%|
```

```
45%|
40%|
35%|
30%|
25%|
20%|
15%|             #
10%|           ###   #
 5%|          ########
    ---------------------------------------------------------
           10        20        30        40        50        60   (minutes)
                  cpu-usage (CPU 0) last 60 minutes (SYSTEM)
```
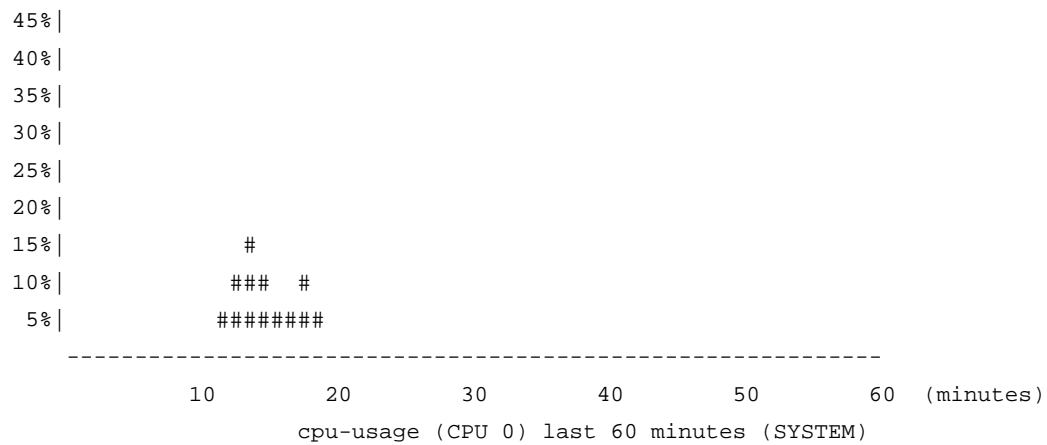
The output shows the historical CPU usage statistics for the entire system (with the name **SYSTEM**) in the last 60 minutes:

- 5%: 12 minutes ago
- 10%: 13 minutes ago
- 15%: 14 minutes ago
- 10%: 15 minutes ago
- 5%: 16 and 17 minutes ago
- 10%: 18 minutes ago
- 5%: 19 minutes ago
- 2% or lower than 2%: Other time

# Display the historical CPU usage statistics for process 1.
```
<Sysname> display cpu-usage history job 1
100%|
 95%|
 90%|
 85%|
 80%|
 75%|
 70%|
 65%|
 60%|
 55%|
 50%|
 45%|
 40%|
 35%|
 30%|
 25%|
 20%|
 15%|
 10%|
  5%|                   #
    ---------------------------------------------------------
           10        20        30        40        50        60   (minutes)
```
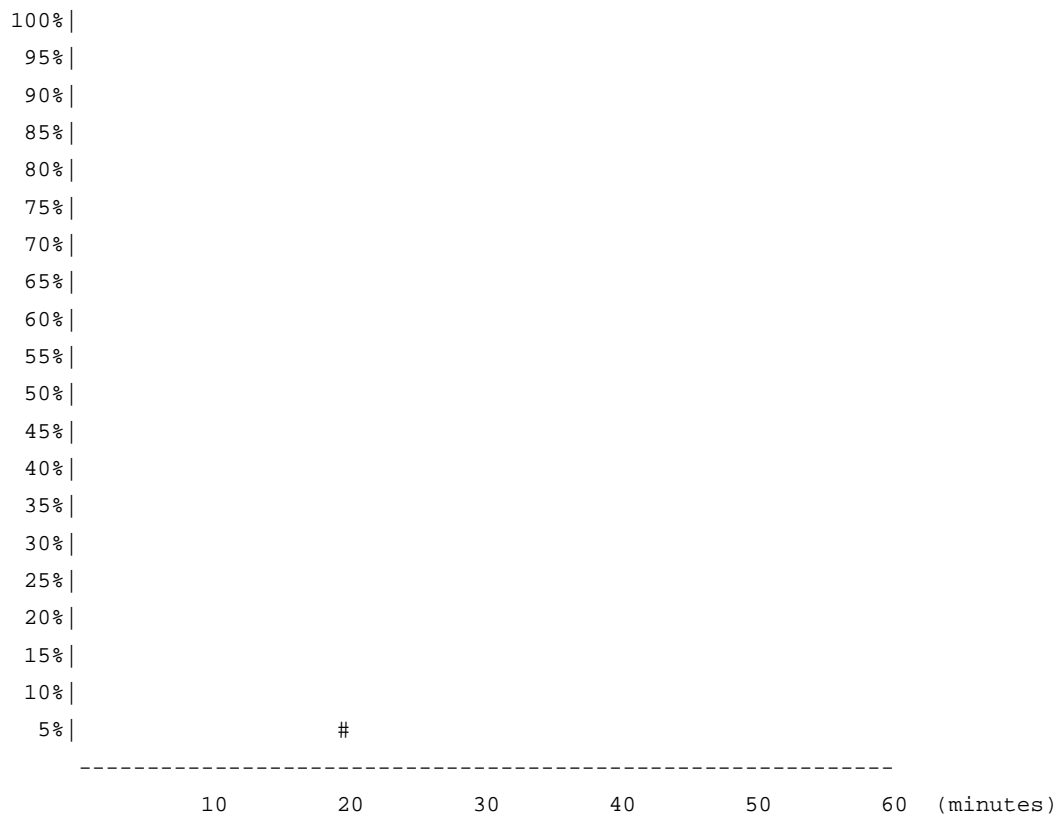
```
                    cpu-usage (CPU 0) last 60 minutes (scmd)
```

The output shows the historical CPU usage statistics of process 1 (with the process name **scmd**) in the last 60 minutes. A process name with square brackets ([ ]) means that the process is a kernel process.

- 5%: 20 minutes ago
- 2% or lower than 2%: Other time

## Related commands

- **monitor cpu-usage enable**
- **monitor cpu-usage interval**

# display device

Use **display device** to display device information.

## Syntax

MSR1000/MSR2000/MSR3000:

**display device** [ **cf-card** | **usb** ] [ **slot** *slot-number* | **verbose** ]

MSR4000:

**display device** [ **cf-card** | **usb** ] [ **slot** *slot-number* [ **subslot** *subslot-number* ] | **verbose** ]

## Views

Any view

## Predefined user roles

network-admin

network-operator

## Parameters

**cf-card**: Specifies the CF cards.

The following matrix shows the support of MSR routers for the CF card:

| Hardware | CF card compatibility |
| --- | --- |
| MSR1000 | No |
| MSR2000 | No |
| MSR3000 | Yes |
| MSR4000 | Yes |

**usb**: Specifies the device connected to the USB interface.

**slot** *slot-number*: Specifies a card by its slot number. (On an MSR1000, MSR2000 or MSR3000.)

**slot** *slot-number*: Specifies a card by its slot number. (On an MSR4000.)

**subslot** *subslot-number*: Specifies a subcard by its subslot number. (On an MSR4000.)

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

## Usage guidelines

If the **cf-card** and **usb** keywords are not provided, this command displays information about all cards on the device.

## Examples

# On an MSR1000, MSR2000 or MSR3000, display device information.

```
<Sysname> display device
Device Name: HP

Slot No.  Board Type               Status    Max Ports
-------------------------------------------------------
0         RPU                      Normal    6
4         DSIC-9FSWP               Normal    9
6         HMIM-4GEE                Normal    4
7         HMIM-1CE3                Normal    1
8         HMIM-2SAE                Normal    2
```

**Table 31 Command output**

| Field | Description |
|-------|-------------|
| Slot No. | Slot number of the card. |
| Board Type | Hardware type of the card. |
| Status | Card status:<br>• **Fault**—The card is faulty and cannot start up.<br>• **Normal**—The card is operating correctly. |
| Max Ports | Maximum number of ports that the card supports. |
| Type | Card type. |
| Hardware | Hardware version of the card. |
| Driver | Driver version of the card. |
| CPLD | CPLD version of the card. |

# On an MSR4000, display device information on the default context.

```
<Sysname> display device
Slot No.     Board Type             Status     Primary     SubSlots
-----------------------------------------------------------------------
0            MPU-100                Normal     Master      0
1            MPU-100                Normal     Standby     0
2            SPU-200                Normal     N/A         10
```

The output shows that the MSR4000 has two MPUs and one interface card. The standby MPU is in slot 0, the active MPU is in slot 1, and the interface card is in slot 2.

**Table 32 Command output**

| Field | Description |
|-------|-------------|
| Slot No. | Slot number of the card. |
| Board Type | Hardware type of the card. |

| Field | Description |
|-------|-------------|
| Status | Card status: <br>• **Absent**—The slot is not installed with a card. <br>• **Fault**—The card is faulty and cannot start up. <br>• **Normal**—The card is operating correctly. |
| Primary | MPU status: <br>• **Standby**—The card is the standby MPU. <br>• **Master**—The card is the active MPU. |
| SubSlots | Maximum number of subcards that the card supports. |

# display device manuinfo

Use **display device manuinfo** to display the electronic label information of the device.

## Syntax

MSR1000/MSR2000/MSR3000:

**display device manuinfo** [ **slot** *slot-number* ]

MSR4000:

**display device manuinfo** [ **slot** *slot-number* [ **subslot** *subslot-number* ] ]

## Views

Any view

## Predefined user roles

network-admin

network-operator

## Parameters

**slot** *slot-number*: Specifies a card by its slot number. (On an MSR1000, MSR2000 or MSR3000.)

**slot** *slot-number*: Specifies a card by its slot number. If you do not specify this option, the command displays the electronic label information of all cards. (On an MSR4000.)

**subslot** *subslot-number*: Specifies a subcard by its subslot number. (On an MSR4000.)

## Usage guidelines

An electronic label is a profile of a device or card. It contains permanent configuration including the serial number, manufacturing date, MAC address, and vendor name. The data is written to the storage component during debugging or testing.

## Examples

# On an MSR1000, MSR2000 or MSR3000, display the electronic label information of the device.

```
<Sysname> display device manuinfo
slot 0
DEVICE_NAME          : MSR3044
DEVICE_SERIAL_NUMBER : 210235A1A0A129000001
MAC_ADDRESS          : 000F-E212-3476
MANUFACTURING_DATE   : 2013-04-12
```

```
VENDOR_NAME          : HP
slot 4
DEVICE_NAME          : RT-DSIC-9FSW-POE-H3
DEVICE_SERIAL_NUMBER : 210231A7702222222222
MAC_ADDRESS          : NONE
MANUFACTURING_DATE   : 2013-05-31
VENDOR_NAME          : HP
slot 6
DEVICE_NAME          : RT-HMIM-4GEE
DEVICE_SERIAL_NUMBER : 210235A2760122356080
MAC_ADDRESS          : 000FE0000080
MANUFACTURING_DATE   : 2013-03-22
VENDOR_NAME          : HP
slot 7
DEVICE_NAME          : RT-HMIM-Adapter
DEVICE_SERIAL_NUMBER : 210235A27601223564500
MAC_ADDRESS          : 000FE0000500
MANUFACTURING_DATE   : 2013-03-22
VENDOR_NAME          : HP
slot 8
DEVICE_NAME          : RT-HMIM-Adapter
DEVICE_SERIAL_NUMBER : 210235A27601223564500
MAC_ADDRESS          : 000FE0000500
MANUFACTURING_DATE   : 2013-03-22
VENDOR_NAME          : HP
```

# On an MSR4000, display the electronic label information of the device.

```
<Sysname> display device manuinfo
Slot 0 CPU 0:
subslot 0
DEVICE_NAME          : RT-MPU-100
DEVICE_SERIAL_NUMBER : 210231A1UXB133000076
MAC_ADDRESS          : 0CDA-41B2-9F95
MANUFACTURING_DATE   : 2013-03-10
VENDOR_NAME          : HP
 Slot 1 CPU 0:
subslot 0
DEVICE_NAME          : RT-MPU-100
DEVICE_SERIAL_NUMBER : 210231A1UXB133000072
MAC_ADDRESS          : 0CDA-41B2-9FA1
MANUFACTURING_DATE   : 2013-03-10
VENDOR_NAME          : HP
 Slot 2 CPU 0:
VENDOR_NAME          : HP
 ...
```

**Table 33 Command output**

| Field | Description |
|---|---|
| Slot 1 CPU 0 | Slot number of the card and number of the CPU. (On an MSR4000.) |
| DEVICE_NAME | Device name. |
| DEVICE_SERIAL_NUMBER | Serial number. |
| MAC_ADDRESS | MAC address. |
| MANUFACTURING_DATE | Manufacturing date. |
| VENDOR_NAME | Vendor name. |

# display device manuinfo fan

Use **display device manuinfo fan** to display the electronic label information of a fan.

**Syntax**

**display device manuinfo fan** *fan-id*

The following matrix shows the support of MSR routers for the command:

| Hardware | Command compatibility |
|---|---|
| MSR1000 | No |
| MSR2000 | No |
| MSR3000 | No |
| MSR4000 | Yes |

**Views**

Any view

**Predefined user roles**

network-admin

network-operator

**Parameters**

*fan-id*: Specifies a fan by its ID. It is always 1.

**Examples**

# Display the electronic label information of fan 1.

```
<Sysname> display device manuinfo fan 1
Fan 1:
DEVICE_NAME          : fan
DEVICE_SERIAL_NUMBER : 210235A36L1234567890
MAC_ADDRESS          : NONE
MANUFACTURING_DATE   : 2013-01-20
VENDOR_NAME          : HP
```

# display device manuinfo power

Use **display device manuinfo power** to display the electronic label information of a power supply.

**display device manuinfo power** *power-id*

The following matrix shows the support of MSR routers for the command:

| Hardware | Command compatibility |
|----------|----------------------|
| MSR1000 | No |
| MSR2000 | MSR2004: No<br>MSR2004-24/MSR2004-48: Yes |
| MSR3000 | Yes |
| MSR4000 | Yes |

## Views

Any view

## Predefined user roles

network-admin

network-operator

## Parameters

*power-id*: Specifies a power supply by its ID.

The following matrix shows the support of MSR routers for the *power-id* argument::

| Hardware | Argument compatibility | Value range |
|----------|----------------------|-------------|
| MSR1000 | No | N/A |
| MSR2000 | MSR2004: No<br>MSR2004-24/MSR2004-48: Yes | MSR2004: N/A<br>MSR2004-24/MSR2004-48: Yes |
| MSR3000 | Yes | 1 to 2 |
| MSR4000 | Yes | 1 to 4 |

## Examples

# Display the electronic label information of power supply 2.

```
<Sysname> display device manuinfo power 2
Power 2:
DEVICE_NAME          : power
DEVICE_SERIAL_NUMBER : 210235A36L1234567890
MAC_ADDRESS          : NONE
MANUFACTURING_DATE   : 2013-01-20
VENDOR_NAME          : HP
```

# display diagnostic-information

Use **display diagnostic-information** to display the operating statistics for multiple feature modules in the system.

## Syntax

**display diagnostic-information** [ **hardware** | **infrastructure** | **l2** | **l3** | **service** ]

## Views

Any view

## Predefined user roles

network-admin

network-operator

## Parameters

**hardware**: Displays hardware-related operating statistics.

**infrastructure**: Displays operating statistics for the fundamental modules.

**l2**: Displays operating statistics for the Layer 2 features.

**l3**: Displays operating statistics for the Layer 3 features.

**service**: Displays operating statistics for upper-layer features.

## Usage guidelines

For diagnostics or troubleshooting, you can do one of the following:

- Use separate **display** commands to collect running status data module by module.
- Use the **display diagnostic-information** command to bulk collect running data for multiple modules.

This **display** command does not support the **| by-linenum** option, the **>** *filename* option, or the **>>** *filename* option. However, this command prompts you to confirm whether you want to save the output to a file or display the output on the screen. The file used to save the output is automatically compressed to save storage space.

## Examples

# Display the operating statistics for multiple feature modules in the system.

```
<Sysname> display diagnostic-information
Save or display diagnostic information (Y=save, N=display)? [Y/N]:n
=============================================
  ==============display clock==============
14:03:55 UTC Thu 01/05/2013
=============================================
  ==============display version==============
…
```

# display environment

Use **display environment** to display the temperature statistics for the temperature sensors, including the current temperature and temperature thresholds.

## Syntax

MSR1000/MSR2000/MSR3000:

**display environment**

MSR4000:

**display environment** [ **slot** *slot-number* ]

## Views

Any view

## Predefined user roles

network-admin

network-operator

## Parameters

**slot** *slot-number*: Specifies a card by its slot number. (On an MSR4000.)

## Usage guidelines

If no card is specified and the **vent** keyword is not specified, this command displays the temperature statistics for all temperature sensors on the device. (On an MSR4000.)

## Examples

# On an MSR1000, MSR2000 or MSR3000, display the temperature statistics for all temperature sensors on the device.

```
<Sysname> display environment
Slot Subslot Sensor  ID Temperature LowerLimit WarningLimit AlarmLimit
-------------------------------------------------------------------
0    0       inflow  1  30          -5         52           62
0    0       hotspot 1  31          -5         54           64
```

# On an MSR4000, display the temperature statistics for all temperature sensors on the device.

```
<Sysname> display environment
Slot Subslot Sensor  ID Temperature LowerLimit WarningLimit AlarmLimit
-------------------------------------------------------------------
0    0       hotspot 1  36          0          60           70
1    0       hotspot 1  38          0          60           70
2    0       inflow  1  33          0          60           70
2    0       hotspot 1  40          0          65           75
```

**Table 34 Command output**

| Field | Description |
|---|---|
| Slot | On an MSR1000, MSR2000 or MSR3000, the value of this field can be one of the following:<br>• *Number*—Specifies the device.<br>• **vent**—Specifies a sensor on the frame or fan tray.<br>On an MSR4000, the value of this field can be one of the following:<br>• *Number*—Specifies a card.<br>• **vent**—Specifies a sensor on the frame or fan tray. |

| Field | Description |
|---|---|
| Subslot | On an MSR1000, MSR2000 or MSR3000, the value of this field can be one of the following:<br>• **0** (zero)—Specifies the device.<br>• *Non-zero number*—Specifies a card.<br>On an MSR4000, the value of this field can be one of the following:<br>• **0** (zero)—Specifies a card.<br>• *Non-zero number*—Specifies a subcard. |
| sensor | Temperature sensor:<br>• **hotspot**—Hotspot sensor.<br>• **inflow**—Air inlet sensor.<br>• **outflow**—Air outlet sensor. |
| ID | Sensor ID. |
| Temperature | Current temperature. |
| LowerLimit | Low temperature threshold. |
| WarningLimit | High-temperature warning threshold. |
| AlarmLimit | High-temperature alarming threshold. |

# display fabric utilization

Use **display fabric utilization** to display the switching fabric channel utilization on interface cards.

## Syntax

**display fabric utilization** [ **slot** *slot-number* ]

The following matrix shows the support of MSR routers for the command:

| Hardware | Command compatibility |
|---|---|
| MSR1000 | No |
| MSR2000 | No |
| MSR3000 | No |
| MSR4000 | Yes |

## Views

Any view

## Predefined user roles

network-admin

network-operator

## Parameters

**slot** *slot-number*: Specifies an interface card by its slot number. If you do not specify this option, the command displays the switching fabric channel utilization on all interface cards. (On an MSR4000.)

## Examples

# Display the switching fabric channel utilization on the interface card in slot 5.

```
<System> display fabric utilization slot 5
                      Input                        Output
Chs Slot Chan Speed Uitl Peak                     Uitl Peak
0    5    0    10G    0%    0% 08:13:14 2013/10/30   0%    0% 08:13:14 2013/10/30
0    5    1    10G    0%    0% 08:13:14 2013/10/30   0%    0% 08:13:14 2013/10/30
0    5    2    10G    0%    0% 08:13:14 2013/10/30   0%    0% 08:13:14 2013/10/30
0    5    3    10G    0%    0% 08:13:14 2013/10/30   0%    0% 08:13:14 2013/10/30
```

**Table 35 Command output**

| Field | Description |
|-------|-------------|
| Chs | The value of this field is always 0. |
| Slot | Slot number of the interface card. |
| Chan | Channel number. |
| Speed | Speed of the channel. |
| Input | Statistics in the inbound direction. |
| Output | Statistics in the outbound direction. |
| Uitl | Channel utilization. |
| Peak | Peak utilization and peak time. |

# display fan

Use **display fan** to display the operating states of fans.

## Syntax

**display fan** [ *fan-id* ]

## Views

Any view

## Predefined user roles

network-admin

network-operator

## Parameters

*fan-id*: Specifies a fan by its ID. The value of this argument is always 1.

## Examples

# Display the operating states of all fans.

```
<Sysname> display fan
```

# display memory

Use **display memory** to display memory usage.

## Syntax

MSR1000/MSR2000/MSR3000:

**display memory**

MSR4000:

**display memory** [ **slot** *slot-number* [ **cpu** *cpu-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 this option, the command displays memory usage for all cards. (On an MSR4000.)

**cpu** *cpu-number*: Specifies a CPU by its number. If you do not specify this option, the command displays information about the default CPU.

## Examples

# Display memory usage.

```
<Sysname> display memory
The statistics about memory is measured in KB:
Slot 0:
              Total      Used      Free    Shared   Buffers    Cached   FreeRatio
Mem:         507980    154896    353084         0       488     54488      69.5%
-/+ Buffers/Cache:      99920    408060
Swap:             0         0         0
```

**Table 36 Command output**

| Field | Description |
|---|---|
| Slot | Specifies the entire device. The value of this field is always 0. (On an MSR1000, MSR2000 or MSR3000.) |
| | Slot number of a card. (On an MSR4000.) |
| Mem | Memory usage information. |
| Total | Total size of the physical memory space that can be allocated. |
| | The memory space is virtually divided into two parts. Part 1 is solely used for kernel codes, kernel management, and ISSU functions. Part 2 can be allocated and used for such tasks as running service modules and storing files. The size of part 2 equals the total size minus the size of part 1. |
| Used | Used physical memory. |
| Free | Free physical memory. |

| Field | Description |
|---|---|
| Shared | Physical memory shared by processes. |
| Buffers | Physical memory used for buffers. |
| Cached | Physical memory used for caches. |
| FreeRatio | Free memory ratio. |
| -/+ buffers/cache | -/+ buffers/cache:used = Mem:Used – Mem:Buffers – Mem:Cached, which indicates the physical memory used by applications.<br><br>-/+ buffers/cache:free = Mem:Free + Mem:Buffers + Mem:Cached, which indicates the physical memory available for applications. |
| Swap | Swap memory. |

# display memory-threshold

Use **display memory-threshold** to display memory usage thresholds and memory usage notification statistics.

## Syntax

MSR1000/MSR2000/MSR3000:

**display memory-threshold**

MSR4000:

**display memory-threshold** [ **slot** *slot-number* [ **cpu** *cpu-number* ] ]

## Views

Any view

## Predefined user roles

network-admin

## Parameters

**slot** *slot-number*: Specifies a card by its slot number. If you do not specify this option, the command displays the memory usage thresholds and memory usage notification statistics for the active MPU. (On an MSR4000.)

**cpu** *cpu-number*: Specifies a CPU by its number. If you do not specify this option, the command displays information about the default CPU.

## Usage guidelines

For more information about memory usage notifications, see log information containing **MEM_EXCEED_THRESHOLD** or **MEM_BELOW_THRESHOLD**.

## Examples

# Display memory usage thresholds and memory usage notification statistics.

```
<Sysname> display memory-threshold
Memory usage threshold:
    Minor: 64M
    Severe: 48M
    Critical: 32M
```

```
        Normal: 96M
Current memory state: Normal
Event statistics:
 [Back to normal state]
    First notification: 2013-5-15 09:21:35.546
    Latest notification: 2013-5-15 09:21:35.546
    Total number of notifications sent: 1
 [Enter minor low-memory state]
    First notification at: 2013-5-15 09:07:05.941
    Latest notification at: 2013-5-15 09:07:05.941
    Total number of notifications sent: 1
 [Back to minor low-memory state]
    First notification at: 0.0
    Latest notification at: 0.0
    Total number of notifications sent: 0
 [Enter severe low-memory state]
    First notification at: 0.0
    Latest notification at: 0.0
    Total number of notifications sent: 0
 [Back to severe low-memory state]
    First notification at: 0.0
    Latest notification at: 0.0
    Total number of notifications sent: 0
 [Enter critical low-memory state]
    First notification at: 0.0
    Latest notification at: 0.0
    Total number of notifications sent: 0
```

# display power-supply

Use **display power-supply** to display power supply information.

## Usage guidelines

The power supply information includes the following:

- Enabled/disabled status of the power supply management function.
- Power supply type, rated input voltage and rated output power.
- Number of redundant power supplies and the available, redundant, used, and remaining power of each power supply.

- Status of the installed power supplies.
- Power supply status of the interface cards.

### Examples

# Display detailed power supply information.

```
<Sysname> display power-supply verbose
```

# display scheduler job

Use **display scheduler job** to display job configuration information.

### Syntax

**display scheduler job** [ *job-name* ]

### Views

Any view

### Predefined user roles

network-admin

network-operator

### Parameters

*job-name*: Specifies a job by its name, a case-sensitive string of 1 to 47 characters. If you do not specify this option, the command displays the configuration information of all jobs.

### Examples

# Display the configuration information of all jobs.

```
<Sysname> display scheduler job
Job name: saveconfig
 copy startup.cfg backup.cfg


Job name: backupconfig


Job name: creat-VLAN100
 system-view
 vlan 100
```

// The output shows that the device has three jobs: the first has one command, the second has no command, and the third has two commands. Jobs are separated by blank lines.

# display scheduler logfile

Use **display scheduler logfile** to display job execution log information.

### Syntax

**display scheduler logfile**

### Views

Any view

## Predefined user roles

network-admin

network-operator

## Examples

# Display job execution log information.

```
<Sysname> display scheduler logfile
Logfile Size: 1902 Bytes.


Job name        : shutdown
Schedule name   : shutdown
Execution time  : Tue Dec 27 10:44:42 2013
Completion time : Tue Dec 27 10:44:47 2013
------------------------------ Job output --------------------------------
<Sysname>system-view
System View: return to User View with Ctrl+Z.
[Sysname]interface rang gigabitethernet 2/1/1 to gigabitethernet 2/1/3
[Sysname-if-range]shutdown
```

Table 37 Command output

| Field | Description |
|---|---|
| Logfile Size | Size of the log file, in bytes. |
| Schedule name | Schedule to which the job belongs. |
| Execution time | Time when the job was started. |
| Completion time | Time when the job was completed. If the job has never been executed or the job has no commands, this field is blank. |
| Job output | Commands in the job and their output. |

## Related commands

reset scheduler logfile

# display scheduler reboot

Use **display scheduler reboot** to display the automatic reboot schedule.

## Syntax

**display scheduler reboot**

## Views

Any view

## Predefined user roles

network-admin

network-operator

## Examples

# Display the automatic reboot schedule.

```
<Sysname> display scheduler reboot
System will reboot at 16:32:00 05/23/2013 (in 1 hours and 39 minutes).
```

### Related commands

- **scheduler reboot at**
- **scheduler reboot delay**

# display scheduler schedule

Use **display scheduler schedule** to display schedule information.

### Syntax

**display scheduler schedule** [ *schedule-name* ]

### Views

Any view

### Predefined user roles

network-admin

network-operator

### Parameters

*schedule-name*: Specifies a schedule by its name, a case-sensitive string of 1 to 47 characters. If you do not specify this option, the command displays information about all schedules.

### Examples

# Display information about all schedules.
```
<Sysname> display scheduler schedule
Schedule name        : shutdown
Schedule type        : Run once after 0 hours 2 minutes
Start time           : Tue Dec 27 10:44:42 2013
Last execution time  : Tue Dec 27 10:44:42 2013
Last completion time : Tue Dec 27 10:44:47 2013
Execution counts     : 1
----------------------------------------------------------------------
Job name                                      Last execution status
shutdown                                      Successful
```

### Table 38 Command output

| Field | Description |
|---|---|
| Schedule type | Execution time setting of the schedule. If no execution time is specified, this field is not displayed. |
| Start time | Time to execute the schedule for the first time. If no execution time is specified, this field is not displayed. |
| Last execution time | Last time when the schedule was executed. If no execution time is specified, this field is not displayed. If the schedule has never been executed, "Yet to be executed" is displayed for this field. |
| Last completion time | Last time when the schedule was completed. If no execution time is specified, this field is not displayed. |

| Field | Description |
|---|---|
| Execution counts | Number of times the schedule has been executed. If the schedule has never been executed, this field is not displayed. |
| Job name | Name of a job under the schedule. |
| Last execution status | Result of the most recent execution:<br>• **Successful**.<br>• **Failed**.<br>• **Waiting**—The device is executing the schedule and the job is waiting to be executed.<br>• **In process**—The job is being executed.<br>• **-NA-**—The execution time has not arrived yet.<br><br>To view information about whether the commands in the job has been executed and the execution results, execute the **display scheduler logfile** command. |

# display transceiver alarm

Use **display transceiver alarm** to display transceiver alarms.

## Syntax

**display transceiver alarm 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 no interface is specified, this command displays the alarms present on every transceiver module.

## Usage guidelines

Table 39 shows the common transceiver alarms. If no error occurs, "None" is displayed.

**Table 39 Common transceiver alarms**

| Field | Description |
|---|---|
| **GBIC/SFP**: | |
| RX loss of signal | Received signals are lost. |
| RX power high | The received optical power is high. |
| RX power low | The received optical power is low. |
| TX fault | Transmission error. |
| TX bias high | The transmitted bias current is high. |
| TX bias low | The transmitted bias current is low. |
| TX power high | The transmitted optical power is high. |

| Field | Description |
|---|---|
| TX power low | The transmitted optical power is low. |
| Temp high | The temperature is high. |
| Temp low | The temperature is low. |
| Voltage high | The voltage is high. |
| Voltage low | The voltage is low. |
| Transceiver info I/O error | Transceiver information read/write error. |
| Transceiver info checksum error | Transceiver information checksum error. |
| Transceiver type and port configuration mismatch | The type of the transceiver module does not match the port configuration. |
| Transceiver type not supported by port hardware | The port does not support this type of transceiver modules. |
| **XFP**: | |
| RX loss of signal | Received signals are lost. |
| RX not ready | The receiving status is not ready |
| RX CDR loss of lock | Receiving CDR loss of lock. |
| RX power high | The received optical power is high. |
| RX power low | The received optical power is low. |
| TX not ready | The transmission status is ready. |
| TX fault | Transmission error. |
| TX CDR loss of lock | Transmission CDR loss of lock. |
| TX bias high | The transmitted bias current is high. |
| TX bias low | The transmitted bias current is low. |
| TX power high | The transmitted optical power is high. |
| TX power low | The transmitted optical power is low. |
| Module not ready | The module is not ready. |
| APD supply fault | Avalanche photo diode error. |
| TEC fault | Thermoelectric cooler error. |
| Wavelength unlocked | Wavelength loss of lock. |
| Temp high | The temperature is high. |
| Temp low | The temperature is low. |
| Voltage high | The voltage is high. |
| Voltage low | The voltage is low. |
| Transceiver info I/O error | Transceiver information read/write error. |
| Transceiver info checksum error | Transceiver information checksum error. |
| Transceiver type and port configuration mismatch | The type of the transceiver module does not match the port configuration. |
| Transceiver type not supported by port hardware | The port does not support this type of transceiver modules. |

| Field | Description |
|---|---|
| **XENPAK:** | |
| WIS local fault | WAN interface sublayer local error. |
| Receive optical power fault | Received optical power error. |
| PMA/PMD receiver local fault | Physical medium attachment/physical medium dependent local error. |
| PCS receive local fault | Physical coding sublayer local error. |
| PHY XS receive local fault | PHY extended sublayer local error. |
| RX power high | The received optical power is high. |
| RX power low | The received optical power is low. |
| Laser bias current fault | Laser bias current error. |
| Laser temperature fault | Laser temperature error. |
| Laser output power fault | Laser output optical power error. |
| TX fault | Transmitter error. |
| PMA/PMD receiver local fault | Physical medium attachment/physical medium dependent receiver local error. |
| PCS receive local fault | Physical coding sublayer receive local error. |
| PHY XS receive local fault | PHY extended sublayer receive local error. |
| TX bias high | The transmitted bias current is high. |
| TX bias low | The transmitted bias current is low. |
| TX power high | The transmitted optical power is high. |
| TX power low | The transmitted optical power is low. |
| Temp high | The temperature is high. |
| Temp low | The temperature is low. |
| Transceiver info I/O error | Transceiver information read/write error. |
| Transceiver info checksum error | Transceiver information checksum error. |
| Transceiver type and port configuration mismatch | The type of the transceiver module does not match the port configuration. |
| Transceiver type not supported by port hardware | The port does not support this type of transceiver modules. |

### Examples

# Display the alarms present on the transceiver module in interface GigabitEthernet 2/1/1.

```
<Sysname> display transceiver alarm interface gigabitethernet 2/1/1
GigabitEthernet2/1/1 transceiver current alarm information:
  RX loss of signal
  RX power low
```

**Table 40 Command output**

| Field | Description |
|---|---|
| transceiver current alarm information | Alarms present on the transceiver module. |

| Field | Description |
|-------|-------------|
| RX loss of signal | Received signals are lost. |
| RX power low | Received power is low. |

# display transceiver diagnosis

Use **display transceiver diagnosis** to display the current values of the digital diagnosis parameters on transceiver modules.

## Syntax

**display transceiver diagnosis 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 no interface is specified, this command displays the current values of the digital diagnosis parameters on every transceiver module.

## Usage guidelines

This command cannot display information about some transceiver modules.

## Examples

# Display the current values of the digital diagnosis parameters on the transceiver module in interface GigabitEthernet 2/1/1.

```
<Sysname> display transceiver diagnosis interface gigabitethernet 2/1/1
GigabitEthernet2/1/1 transceiver diagnostic information:
  Current diagnostic parameters:
    Temp(°C)   Voltage(V)  Bias(mA)  RX power(dBm)  TX power(dBm)
    36         3.31        6.13      -35.64         -5.19
  Alarm thresholds:
           Temp(°C)   Voltage(V)  Bias(mA)  RX power(dBM)  TX power(dBM)
    High   50         3.55        1.44      -10.00         5.00
    Low    30         3.01        1.01      -30.00         0.00
```

**Table 41 Command output**

| Field | Description |
|-------|-------------|
| transceiver diagnostic information | Digital diagnosis information of the transceiver module in the interface. |
| Temp.(°C) | Temperature in °C, accurate to 1°C. |
| Voltage(V) | Voltage in V, accurate to 0.01 V. |
| Bias(mA) | Bias current in mA, accurate to 0.01 mA. |

| Field | Description |
|-------|-------------|
| RX power(dBm) | RX power in dBm, accurate to 0.01 dBm. |
| TX power(dBm) | TX power in dBm, accurate to 0.01 dBm. |

# display transceiver interface

Use **display transceiver interface** to display the key parameters of transceiver modules.

## Syntax

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

## Views

Any view

## Predefined user roles

network-admin

network-operator

## Parameters

*interface-type interface-number*: Specifies an interface by its type and number. If you do not specify this option, the command displays the key parameters of every transceiver module.

## Examples

# Display the key parameters of the transceiver module in interface GigabitEthernet 2/1/1.

```
<Sysname> display transceiver interface gigabitethernet 2/1/1
GigabitEthernet2/1/1 transceiver information:
  Transceiver Type            : 1000_BASE_SX_SFP
  Connector Type              : LC
  Wavelength(nm)              : 850
  Transfer Distance(m)        : 550(50um),270(62.5um)
  Digital Diagnostic Monitoring : YES
  Vendor Name                 : HP
  Ordering Name               : SFP-GE-SX-MM850
```

**Table 42 Command output**

| Field | Description |
|-------|-------------|
| transceiver information | Transceiver information. |
| Transceiver Type | Transceiver type. |
| Connector Type | Connector type options:<br>• **SC**—Fiber connector developed by NTT.<br>• **LC**—1.25 mm/RJ-45 fiber connector developed by Lucent.<br>• **RJ-45**.<br>• **CX 4**. |

| Field | Description |
|---|---|
| Wavelength(nm) | • Fiber transceiver: Central wavelength (in nm) of the transmit laser. If the transceiver supports multiple wavelengths, every two wavelength values are separated by a comma.<br>• Copper cable: Displayed as N/A. |
| Transfer Distance(xx) | Transmission distance, where "xx" indicates the distance unit:<br>• **km**—Kilometers, for single-mode transceiver modules.<br>• **m**—Meters, for other transceiver modules.<br>If the transceiver module supports multiple types of transmission media, this field displays the transmission distance for each type of transmission medium, in the form *transmission distance* (*medium type*).<br>Transmission medium types include:<br>• **9 um**—9/125 $\mu$m single-mode fiber.<br>• **50 um**—50/125 $\mu$m multi-mode fiber.<br>• **62.5 um**—62.5/125 $\mu$m multi-mode fiber.<br>• **TP**—Twisted pair.<br>• **CX4**—CX4 cable. |
| Digital Diagnostic Monitoring | Support for the digital diagnosis function:<br>• **YES**—Supported.<br>• **NO**—Not supported. |
| Ordering Name | Product code. |

# display transceiver manuinfo

Use **display transceiver manuinfo** to display the electronic label information of transceiver modules.

## Syntax

**display transceiver manuinfo 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 no interface is specified, this command displays the electronic label information of the transceiver modules on all interfaces.

## Usage guidelines

This command displays only part of the electronic label information.

## Examples

# Display the electronic label information for the transceiver module in interface GigabitEthernet 2/1/1.

```
<Sysname> display transceiver manuinfo interface gigabitethernet 2/1/1
GigabitEthernet2/1/1 transceiver manufacture information:
```

```
   Manu. Serial Number  : 213410A0000054000251
   Manufacturing Date   : 2013-09-01
   Vendor Name          : HP
```

**Table 43 Command output**

| Field | Description |
|---|---|
| Manu. Serial Number | Serial number generated during production of the transceiver module. |
| Manufacturing Date | Date when the electronic label information was written to the transceiver module. |

# display version

Use **display version** to display system version information.

### Syntax

**display version**

### Views

Any view

### Predefined user roles

network-admin

network-operator

### Examples

# Display system version information.

```
<Sysname> display version
```

# display version-update-record

Use **display version-update-record** to display the startup software image upgrade history records. (On an MSR1000, MSR2000 or MSR3000.)

Use **display version-update-record** to display the startup software image upgrade history records of the active MPU. (On an MSR4000.)

### Syntax

**display version-update-record**

### Views

Any view

### Predefined user roles

network-admin

network-operator

### Usage guidelines

The device records its current startup software version information and all subsequent version update information. Such information can survive reboots.

The maximum number of records is 10.

## Examples

# Display the startup software image upgrade history records.

```
<Sysname> display version-update-record
  Name                                Version          Compile time
Record 1  (updated on Jul 27 2013 at 09:47:58):
* boot-e2205.bin                      7.1.035 ESS 2205   Jul 26 2013 10:55:58
  system-e2205.bin                    7.1.035 ESS 2205   Jul 26 2013 10:56:14
Record 2  (updated on Jul 25 2013 at 14:26:11):
* boot-e2205.bin                      1.1.0 ESS 2205     Jul 23 2013 20:04:55
* system-e2205.bin                    7.1.035 ESS 2205   Jul 23 2013 20:05:13
Record 3  (updated on Jul 11 2013 at 08:43:37):
* boot-a2203.bin                      1.1.0 Alpha 2203   Jul 08 2013 11:32:51
* system-a2203.bin                    7.1.034 Alpha 2203 Jul 08 2013 11:33:08
Record 4  (updated on Jun 05 2013 at 17:52:56):
* boot-t2202.bin                      1.1.0 Test 2202    Jun 05 2013 16:23:45
* system-t2202.bin                    7.1.033 Test 2202  Jun 05 2013 16:24:03
```

**Table 44 Command output**

| Field | Description |
|-------|-------------|
| Name | Software image file name. |
| * | The new software image is different from the old one. |

## Related commands

**reset version-update-record**

# header

Use **header** to create a banner.

Use **undo header** to clear a banner.

## Syntax

**header** { **incoming** | **legal** | **login** | **motd** | **shell** } *text*

**undo header** { **incoming** | **legal** | **login** | **motd** | **shell** }

## Views

System view

## Predefined user roles

network-admin

## Parameters

**incoming**: Configures the banner to be displayed before a modem dial-up user accesses user view. If authentication is required, the incoming banner appears after the authentication is passed.

**legal**: Configures the banner to be displayed before a user inputs the username and password to access the CLI.

**login**: Configures the banner displayed to be before password or scheme authentication is performed for a login user.

**motd**: Configures the greeting banner to be displayed before the legal banner appears.

**shell**: Configures the banner to be displayed before a non-modem dial-in user accesses user view.

*text*: Specifies the banner message, which can be entered in two formats. For more information, see *Fundamentals Configuration Guide*.

## Examples

# Create the incoming banner, legal banner, login banner, MOTD banner, and shell banner.

```
<Sysname> system-view
[Sysname] header incoming
Please input banner content, and quit with the character '%'.
Welcome to incoming(header incoming)%
[Sysname] header legal
Please input banner content, and quit with the character '%'.
Welcome to legal (header legal)%
[Sysname] header login
Please input banner content, and quit with the character '%'.
Welcome to login(header login)%
[Sysname] header motd
Please input banner content, and quit with the character '%'.
Welcome to motd(header motd)%
[Sysname] header shell
Please input banner content, and quit with the character '%'.
Welcome to shell(header shell)%
```

In this example, the percentage sign (%) is the starting and ending character of the *text* argument. Entering the percentage sign after the text quits the **header** command. Because it is the starting and ending character, the percentage sign is not included in the banner.

# Test the configuration by using Telnet. The login banner appears only when password or scheme login authentication has been configured.

```
******************************************************************************
* Copyright (c) 2010-2014 Hewlett-Packard Development Company, L.P.          *
* Without the owner's prior written consent,                                 *
* no decompiling or reverse-engineering shall be allowed.                    *
******************************************************************************


Welcome to legal (header legal)
 Press Y or ENTER to continue, N to exit.


Welcome to motd(header motd)


Welcome to login(header login)


Login authentication


Password:
```

```
Welcome to shell(header shell)
```

# job

Use **job** to assign a job to a schedule.

Use **undo job** to revoke a job.

## Syntax

**job** *job-name*

**undo job** *job-name*

## Default

No job is assigned to a schedule.

## Views

Schedule view

## Predefined user roles

network-admin

## Parameters

*job-name*: Specifies the job name, a case-sensitive string of 1 to 47 characters.

## Usage guidelines

You can assign multiple jobs to a schedule. The jobs in a schedule are executed concurrently.

The jobs to be assigned to a schedule must already exist. To create a job, use the **scheduler job** command.

## Examples

\# Assign job **save-job** to schedule **saveconfig**.

```
<Sysname> system-view
[Sysname] scheduler schedule saveconfig
[Sysname-schedule-saveconfig] job save-job
```

## Related commands

- **scheduler job**
- **scheduler schedule**

# memory-threshold

Use **memory-threshold** to set memory usage thresholds.

Use **undo memory-threshold** to restore the defaults.

## Syntax

MSR1000/MSR2000/MSR3000:

**memory-threshold minor** *minor-value* **severe** *severe-value* **critical** *critical-value* **normal** *normal-value*

**undo memory-threshold**

MSR4000:

**memory-threshold** [ **slot** *slot-number* [ **cpu** *cpu-number* ] ] **minor** *minor-value* **severe** *severe-value* **critical** *critical-value* **normal** *normal-value*

**undo memory-threshold** [ **slot** *slot-number* [ **cpu** *cpu-number* ] ]

## Default

- Minor alarm threshold: 96 MB.
- Severe alarm threshold: 64 MB.
- Critical alarm threshold: 48 MB.
- Normal state threshold: 128 MB.

## Views

System view

## Predefined user roles

network-admin

## Parameters

**minor** *minor-value*: Specifies the minor alarm threshold. This threshold must be equal to or less than the normal state threshold. Setting this threshold to 0 disables the minor alarm function.

**severe** *severe-value*: Specifies the severe alarm threshold. This threshold must be equal to or less than the minor alarm threshold. Setting this threshold to 0 disables the severe alarm function.

**critical** *critical-value*: Specifies the critical alarm threshold. This threshold must be equal to or less than the severe alarm threshold. Setting this threshold to 0 disables the critical alarm function.

**normal** *normal-value*: Specifies the normal state threshold. This threshold must be equal to or greater than the total memory size.

**slot** *slot-number*: Specifies a card by its slot number. If you do not specify this option, the command sets memory usage thresholds for the active MPU. (On an MSR4000.)

**cpu** *cpu-number*: Specifies a CPU by its number. If you do not specify this option, the command sets memory usage thresholds for the default CPU.

The following matrix shows the value ranges for the *minor-value*, *severe-value*, *critical-value*, and *normal-value* arguments:

| Hardware | Value range |
| --- | --- |
| MSR1000 | 0~497 |
| MSR2000 | 0 to 1003 |
| MSR3000 | 0 to 1981 |
| MSR4000 | 0 to 1981 |

## Usage guidelines

To ensure correct operation and improve memory utilization, the system monitors the amount of free memory space in real time. When a threshold is exceeded, the system sends an alarm notification or an alarm-removed notification to affected feature modules or processes so they can take countermeasures. For more information about the thresholds, see *Fundamentals Configuration Guide.*

## Examples

# Set the minor alarm, severe alarm, critical alarm, and normal state thresholds to 64 MB, 48 MB, 32 MB, and 96 MB, respectively.

```
<Sysname> system-view
[Sysname] memory-threshold minor 64 severe 48 critical 32 normal 96
```

# monitor cpu-usage enable

Use **monitor cpu-usage enable** to enable CPU usage monitoring.

Use **undo monitor cpu-usage enable** to disable CPU usage monitoring.

## Syntax

MSR1000/MSR2000/MSR3000:

**monitor cpu-usage enable**

**undo monitor cpu-usage enable**

MSR4000:

**monitor cpu-usage enable** [ **slot** *slot-number* [ **cpu** *cpu-number* ] ]

**undo monitor cpu-usage enable** [ **slot** *slot-number* [ **cpu** *cpu-number* ] ]

## Default

CPU usage monitoring is enabled.

## Views

System view

## Predefined user roles

network-admin

## Parameters

**slot** *slot-number*: Specifies a card by its slot number. If you do not specify this option, the command enables CPU usage monitoring for the active MPU. (On an MSR4000.)

**cpu** *cpu-number*: Specifies a CPU by its number. If you do not specify this option, the command sets memory usage thresholds for the default CPU.

## Examples

# Enable CPU usage monitoring.

```
<Sysname> system-view
[Sysname] monitor cpu-usage enable
```

## Related commands

- **display cpu-usage**
- **display cpu-usage configuration**
- **display cpu-usage history**
- **monitor cpu-usage interval**

# monitor cpu-usage interval

Use **monitor cpu-usage interval** to set the CPU usage sampling interval.

## Syntax

MSR1000/MSR2000/MSR3000:

**monitor cpu-usage interval** *interval-value*

MSR4000:

**monitor cpu-usage interval** *interval-value* [ **slot** *slot-number* [ **cpu** *cpu-number* ] ]

## Default

The system samples CPU usage every 1 minute.

## Views

System view

## Predefined user roles

network-admin

## Parameters

*interval-value*: Specifies the CPU usage sampling interval. Valid values include **5Sec** for 5 seconds, **1Min** for 1 minute, and **5Min** for 5 minutes.

**slot** *slot-number*: Specifies a card by its slot number. If you do not specify this option, the command sets the CPU usage sampling interval for the active MPU. (On an MSR4000.)

**cpu** *cpu-number*: Specifies a CPU by its number. If you do not specify this option, the command sets the CPU usage sampling interval for the default CPU.

## Examples

# Set the CPU usage sampling interval to 5 seconds.

```
<Sysname> system-view
[Sysname] monitor cpu-usage interval 5Sec
```

## Related commands

- **display cpu-usage**
- **display cpu-usage configuration**
- **display cpu-usage history**
- **monitor cpu-usage enable**

# password-recovery enable

Use **password-recovery enable** to enable password recovery capability.

Use **undo password-recovery enable** to disable password recovery capability.

## Syntax

**password-recovery enable**

**undo password-recovery enable**

### Default

Password recovery capability is enabled.

### Views

System view

### Predefined user roles

network-admin

### Usage guidelines

Password recovery capability controls console user access to the device configuration and SDRAM from Boot ROM menus.

If password recovery capability is enabled, a console user can access the device configuration without authentication to configure new passwords.

If password recovery capability is disabled, console users must restore the factory-default configuration before they can configure new passwords. Restoring the factory-default configuration deletes the next-startup configuration files.

To enhance system security, disable password recovery capability.

Availability of Boot ROM menu options varies by the password recovery capability setting. For more information, see the release notes.

### Examples

# Disable password recovery capability.

```
<Sysname> system-view
[Sysname] undo password-recovery enable
```

# power-supply off

Use **power-supply off** to power off a card or subcard.

### Syntax

MSR1000/MSR2000/MSR3000:

**power-supply off slot** *slot-number*

MSR4000:

**power-supply off slot** *slot-number* [ **subslot** *subslot-number* ]

### Default

The default setting of this command varies by device model.

### Views

User view

### Predefined user roles

network-admin

### Parameters

**slot** *slot-number*: Specifies a subcard by its subslot number. (On an MSR1000, MSR2000 or MSR3000.)

**slot** *slot-number*: Specifies a card by its slot number. (On an MSR4000.)

**subslot** *subslot-number*: Specifies a subcard by its subslot number. If you do not specify this option, the command stops supplying power to all subcards on the card.

### Usage guidelines

When power is insufficient, you can power off interface cards that are idle or connected to unimportant network nodes to ensure power supply to critical interface cards.

### Examples

# On an MSR4000, power off the card in slot 9.

```
<Sysname> power-supply off slot 9
```

# power-supply on

Use **power-supply on** to power on a card or subcard.

### Syntax

MSR1000/MSR2000/MSR3000:

**power-supply on slot** *slot-number*

MSR4000:

**power-supply on slot** *slot-number* [ **subslot** *subslot-number* ]

### Default

The default setting of this command varies by device model.

### Views

User view

### Predefined user roles

network-admin

### Parameters

**slot** *slot-number*: Specifies a subcard by its subslot number. (On an MSR1000, MSR2000 or MSR3000.)

**slot** *slot-number*: Specifies a card by its slot number. (On an MSR4000.)

**subslot** *subslot-number*: Specifies a subcard by its subslot number. If you do not specify this option, the command starts power supply to all subcards on the card.

### Examples

# On an MSR4000, power on the card in slot 9.

```
<Sysname> power-supply on slot 9
```

# power-supply policy enable

Use **power-supply policy enable** to enable power supply management.

Use **undo power-supply policy enable** to disable power supply management.

### Syntax

**power-supply policy enable**

**undo power-supply policy enable**

The following matrix shows the support of MSR routers for the command:

| Hardware | Command compatibility |
|----------|----------------------|
| MSR1000 | No |
| MSR2000 | No |
| MSR3000 | No |
| MSR4000 | Yes |

## Default

Power supply management is disabled.

## Views

System view

## Predefined user roles

network-admin

## Examples

# Enable power supply management.

```
<Sysname> system-view
[Sysname] power-supply policy enable
```

# power-supply policy redundant

Use **power-supply policy redundant** to specify the number of redundant power supplies.

Use **undo power-supply policy redundant** to restore the default.

## Syntax

**power-supply policy redundant** *module-count*

**undo power-supply policy redundant**

The following matrix shows the support of MSR routers for the command:

| Hardware | Command compatibility |
|----------|----------------------|
| MSR1000 | No |
| MSR2000 | No |
| MSR3000 | No |
| MSR4000 | Yes |

## Default

The number of redundant power supplies is 0.

## Views

System view

## Predefined user roles

network-admin

## Parameters

*module-count*: Specifies the number of redundant power supplies. To view the value range, use the online help for this command at the CLI. The upper limit of the value range is the maximum number of redundant power supplies supported by the system. Depending on the number of the inserted interface cards and power consumption, the actual number of redundant power supplies that you can configure is smaller than or equal to the maximum number of redundant power supplies supported by the system.

## Usage guidelines

The configuration of this command takes effect only when power supply management is enabled.

## Examples

# Set the number of redundant power supplies to 3.

```
<Sysname> system-view
[Sysname] power-supply policy redundant 3
```

# reboot

Use **reboot** to reboot the device or a subcard. (On an MSR1000, MSR2000 or MSR3000.)

Use **reboot** to reboot a card, a subcard, or the entire system. (On an MSR4000.)

## Syntax

MSR1000/MSR2000/MSR3000:

**reboot** [ **subslot** *subslot-number* ] [ **force** ]

MSR4000:

**reboot** [ **slot** *slot-number* [ **subslot** *subslot-number* ] ] [ **force** ]

## Default

The default setting varies by device model.

## Views

User view

## Predefined user roles

network-admin

## Parameters

**slot** *slot-number*: Specifies a subcard by its subslot number. (On an MSR1000, MSR2000 or MSR3000.)

**slot** *slot-number*: Specifies a card by its slot number. (On an MSR4000.)

**subslot** *subslot-number*: Specifies a subcard by its subslot number.

**force**: Reboots the device immediately without performing any software or hard disk check. If this keyword is not specified, the system checks, for example, whether the main system software image file exists and whether the hard disk is not being written. If any circumstance might affect data protection, the system does not reboot the device.

## Usage guidelines

> **CAUTION:**
> - A device reboot might interrupt network services.
> - If the main startup software images are corrupted or missing, you must re-specify a set of main startup software images before using the **reboot** command to reboot the device. Otherwise, the device cannot start up.
> - Use the **force** keyword only when the device fails or a **reboot** command without the **force** keyword cannot perform a reboot task correctly. A **reboot** command with the **force** keyword might result in file system corruption because it does not perform any data protection.

For data security, the device does not reboot if you reboot the device while the device is performing file operations.

To reboot the entire device, do not specify the slot number option. To reboot a card, specify the slot number.

## Examples

# Reboot the device when no configuration change has occurred since the last time you saved the running configuration.

```
<Sysname> reboot
Start to check configuration with next startup configuration file, please
wait.........DONE!
This command will reboot the device. Continue? [Y/N]:y
Now rebooting, please wait...
```

# If any configuration has changed, reboot the device and save the configuration.

```
<Sysname> reboot
Start to check configuration with next startup configuration file, please
wait.........DONE!
Current configuration will be lost after the reboot, save current configuration? [Y/N]:y
Please input the file name(*.cfg)[flash:/startup.cfg]
(To leave the existing filename unchanged, press the enter key):
flash:/startup.cfg exists, overwrite? [Y/N]:y
Validating file. Please wait...
Configuration is saved to flash successfully.
This command will reboot the device. Continue? [Y/N]:y
Now rebooting, please wait...
```

# If any configuration has changed, reboot the device but do not save the configuration.

```
<Sysname> reboot
Start to check configuration with next startup configuration file, please
wait.........DONE!
Current configuration will be lost after the reboot, save current configuration? [Y/N]:n
This command will reboot the device. Continue? [Y/N]:y
Now rebooting, please wait...
```

# Reboot the device immediately without performing any software check.

```
<Sysname> reboot force
A forced reboot might cause the storage medium to be corrupted. Continue? [Y/N]:y
Now rebooting, please wait...
```

# On an MSR4000, reboot the interface card in slot 2.

```
<Sysname> reboot slot 2
Start to check configuration with next startup configuration file, please wait..
........DONE!
This command will reboot the specified slot, Continue? [Y/N]:y
Now rebooting, please wait...
```

# On an MSR4000, reboot the interface card in slot 2 by force.

```
<Sysname> reboot slot 2 force
A forced reboot might cause the storage medium to be corrupted. Continue? [Y/N]:y
Now rebooting, please wait...
```

# remove

Use **remove** to unmount an HMIM module.

## Syntax

**remove hmimslot** *slot-number*

The following matrix shows the support of MSR routers for the command:

| Hardware | Command compatibility |
|----------|----------------------|
| MSR1000 | No |
| MSR2000 | MSR2004: No<br>MSR2004-24/MSR2004-48: Yes |
| MSR3000 | Yes |
| MSR4000 | Yes |

## Views

User view

## Predefined user roles

network-admin

## Parameters

*slot-number*: Specifies an HMIM module by its slot number.

## Usage guidelines

⚠ CAUTION:

Use this command with caution. This command stops all services provided by the HMIM module.

You cannot display or configure an unmounted HMIM module.

## Examples

# Unmount the HMIM module in slot 6.

```
<sysname> remove hmimslot 6
You can remove the card now!
```

# reset scheduler logfile

Use **reset scheduler logfile** to clear job execution log information.

**Syntax**

**reset scheduler logfile**

**Views**

User view

**Predefined user roles**

network-admin

**Examples**

# Clear job execution log information.

```
<Sysname> reset scheduler logfile
```

**Related commands**

**display scheduler logfile**

# reset version-update-record

Use **reset version-update-record** to clear the startup software image upgrade history records. (On an MSR1000, MSR2000 or MSR3000.)

Use **reset version-update-record** to clear the startup software image upgrade history records of the active MPU. (On an MSR4000.)

**Syntax**

**reset version-update-record**

**Views**

System view

**Predefined user roles**

network-admin

**Examples**

# Clear the startup software image upgrade history records.

```
<Sysname> system-view
[Sysname] reset version-update-record
```

**Related commands**

**display version-update-record**

# restore factory-default

Use **restore factory-default** to restore the factory-default configuration for the device.

**Syntax**

**restore factory-default**

**Views**

User view

**Predefined user roles**

network-admin

**Usage guidelines**

⚠ CAUTION:

This command is disruptive. Use this command only when you cannot troubleshoot the device by using other methods, or you want to use the device in a different scenario.

This command does the following:

- Deletes all configuration files (.cfg files) in the root directories of the storage media.
- Deletes all log files (.log files in the folder /logfile).
- Clears all log information (in the log buffer), trap information, and debugging information.
- Restores the parameters for the BootWare to the factory-default settings.
- Deletes all license files (.ak files).

After this command is executed, only the items required for fundamental device operation are retained, including the .bin files, the MAC addresses, and the electronic label information.

**Examples**

# Restore the factory-default configuration for the device.

```
<Sysname> restore factory-default
This command will restore the system to the factory default configuration and clear the
operation data. Continue [Y/N]:y
Restoring the factory default configuration. This process might take a few minutes. Please
wait........................................................................................
.........................Done.
Please reboot the system to place the factory default configuration into effect.
```

**Related commands**

**reboot**

# scheduler job

Use **scheduler job** to create a job and enter job view. If the job already exists, you enter job view directly.

Use **undo scheduler job** to delete a job.

**Syntax**

**scheduler job** *job-name*

**undo scheduler job** *job-name*

**Default**

No job exists.

**Views**

System view

**Predefined user roles**

network-admin

**Parameters**

*job-name*: Specifies the job name, a case-sensitive string of 1 to 47 characters.

**Usage guidelines**

A job can be referenced by multiple schedules. In job view, you can assign commands to the job.

**Examples**

# Create a job named **backupconfig** and enter job view.

```
<Sysname> system-view
[Sysname] scheduler job backupconfig
[Sysname-job-backupconfig]
```

**Related commands**

- **command**
- **scheduler schedule**

# scheduler logfile size

Use **scheduler logfile size** to set the size of the job execution log file.

**Syntax**

**scheduler logfile size** *value*

**Default**

The size of the job execution log file is 16 KB.

**Views**

System view

**Predefined user roles**

network-admin

**Parameters**

*value*: Sets the size of the job execution log file, in KB. The value range is 16 to 1024.

**Usage guidelines**

The job execution log file saves the execution information of jobs. If the file is full, old records will be replaced by new records. If the size of the log information to be written to the file is larger than the size of the file, the excessive information is not written to the file.

**Examples**

# Set the size of the job execution log file to 32 KB.

```
<Sysname> system-view
[Sysname] scheduler logfile size 32
```

**Related commands**

**display scheduler logfile**

# scheduler reboot at

Use **scheduler reboot at** to specify the reboot date and time.

Use **undo scheduler reboot** to remove the reboot schedule configuration.

## Syntax

**scheduler reboot at** *time* [ *date* ]

**undo scheduler reboot**

## Default

No reboot date or time is specified.

## Views

User view

## Predefined user roles

network-admin

## Parameters

*time*: Specifies the reboot time in the format *hh:mm*. The *hh* value is in the range of 0 to 23. The *mm* value is in the range of 0 to 59.

*date*: Specifies the reboot date in the format *MM/DD/YYYY* or *YYYY/MM/DD*. The *YYYY* value is in the range of 2000 to 2035. The *MM* value is in the range of 1 to 12. The value range for *DD* varies by month.

## Usage guidelines

⚠ CAUTION:

Device reboot interrupts network services.

When the *date* argument is not specified:

- If the reboot time is later than the current time, a reboot occurs at the reboot time of the current day.
- If the reboot time is earlier than the current time, a reboot occurs at the reboot time the next day.

For data security, if you are performing file operations at the reboot time, the system does not reboot.

The device supports only one device reboot schedule. If you configure both the **schedule reboot delay** and **schedule reboot delay** commands or configure one of the commands multiple times, the most recent configuration takes effect.

## Examples

# Configure the device to reboot at 12:00 p.m. This example assumes that the current time is 11:43 a.m. on June 6, 2013.

```
<Sysname> scheduler reboot at 12:00
Reboot system at 12:00:00 06/06/2013 (in 0 hours and 16 minutes). Confirm? [Y/N]:
```

## Related commands

**scheduler reboot delay**

# scheduler reboot delay

Use **scheduler reboot delay** to specify the reboot delay time.

Use **undo scheduler reboot** to remove the reboot schedule configuration.

## Syntax

**scheduler reboot delay** *time*

**undo scheduler reboot**

## Default

No reboot delay time is specified.

## Views

User view

## Predefined user roles

network-admin

## Parameters

*time*: Specifies the reboot delay time in the format *hh:mm* or *mm*. This argument can consist up to 6 characters. When in the format *hh:mm*, *mm* must be in the range of 0 to 59.

## Usage guidelines

> △ CAUTION:
>
> Device reboot interrupts network services.

For data security, if you are performing file operations at the reboot time, the system does not reboot.

The device supports only one device reboot schedule. If you configure both the **schedule reboot delay** and **schedule reboot delay** commands or configure one of the commands multiple times, the most recent configuration takes effect.

## Examples

# Configure the device to reboot after 88 minutes. This example assumes that the current time is 11:48 a.m. on June 6, 2013.

```
<Sysname> scheduler reboot delay 88
Reboot system at 13:16 06/06/2013(in 1 hours and 28 minutes). Confirm? [Y/N]:
```

# scheduler schedule

Use **scheduler schedule** to create a schedule and enter schedule view. If the schedule already exists, you enter schedule view directly.

Use **undo scheduler schedule** to delete a schedule.

## Syntax

**scheduler schedule** *schedule-name*

**undo scheduler schedule** *schedule-name*

## Default

No schedule exists.

## Views

System view

## Predefined user roles

network-admin

## Parameters

*schedule-name*: Specifies the schedule name, a case-sensitive string of 1 to 47 characters.

## Usage guidelines

You can configure a schedule to have the device automatically run a command or a set of commands without administrative interference.

To configure a schedule:

1. Use the **scheduler job** command to create a job.
2. Use the **command** command to assign commands to the job.
3. Use the **scheduler schedule** command to create a schedule.
4. Use the **job** command to assign the job to the schedule. You can assign multiple jobs to a schedule. The jobs must already exist.
5. Use the **user-role** command to assign user roles to the schedule. You can assign up to 64 user roles to a schedule.
6. Use the **time at**, **time once**, or **time repeating** command to specify an execution time for the schedule. You can specify only one execution time for a schedule.

## Examples

# Create a schedule named **saveconfig**.

```
<Sysname> system-view
[Sysname] scheduler schedule saveconfig
```

## Related commands

- **job**
- **time at**
- **time interval**
- **time once**

# shutdown-interval

Use **shutdown-interval** to set the detection timer.

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

## Syntax

**shutdown-interval** *time*

**undo shutdown-interval**

## Default

The detection interval is 30 seconds.

## Views

System view

### Predefined user roles

network-admin

### Parameters

*time*: Specifies a detection timer (in seconds) in the range of 1 to 300.

### Usage guidelines

The device starts a detection timer when a port is shut down by a protocol. If the port is still down when the detection timer expires, the device automatically brings up the port so the port status reflects the port's actual physical status.

If you change the detection timer to T1 during port detection, the interval from when you change the timer to the time when the protocol module shuts down the port is T. If T<T1, the down port will be recovered after T1-T time. If T>=T1, the down port is recovered immediately. For example, if the detection timer is set to 30 seconds and you change it to 10 seconds (T1=10) two seconds after the port is shut down (T=2), this port will be recovered 8 seconds later. If the detection timer is set to 30 seconds and you change it to 2 seconds ten seconds after the port is shut down, this port is recovered immediately.

### Examples

# Set the detection timer to 100 seconds.

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

## sysname

Use **sysname** to set the device name.

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

### Syntax

**sysname** *sysname*

**undo sysname**

### Default

The device name is **HP**.

### Views

System view

### Predefined user roles

network-admin

### Parameters

*sysname*: Specifies a name for the device, a string of 1 to 64 characters.

### Usage guidelines

A device name identifies a device in a network and is used as the user view prompt at the CLI. For example, if the device name is **Sysname**, the user view prompt is <Sysname>.

### Examples

# Set the name of the device to **R2000**.

```
<Sysname> system-view
[Sysname] sysname R2000
```

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```
[R2000]
```

# time at

Use **time at** to specify an execution date and time for a one-time schedule.

Use **undo time** to remove the execution time configuration for a schedule.

## Syntax

**time at** *time date*

**undo time**

## Default

No execution time or date is specified for a schedule.

## Views

Schedule view

## Predefined user roles

network-admin

## Parameters

*time*: Specifies the schedule execution time in the format *hh:mm*. The *hh* value is in the range of 0 to 23. The *mm* value is in the range of 0 to 59.

*date*: Specifies the schedule execution date in the format *MM/DD/YYYY* or *YYYY/MM/DD*. The *YYYY* value is in the range of 2000 to 2035. The *MM* value is in the range of 1 to 12. The value range for *DD* varies by month.

## Usage guidelines

The specified time (date plus time) must be later than the current system time.

The **time at** command, the **time once** command, and the **time repeating** command overwrite one another. The most recently configured command takes effect.

## Examples

# Configure the device to execute schedule **saveconfig** at 01:01 a.m. on May 11, 2013.

```
<Sysname> system-view
[Sysname] scheduler schedule saveconfig
[Sysname-schedule-saveconfig] time at 1:1 2013/05/11
```

## Related commands

**scheduler schedule**

# time once

Use **time once** to specify one or more execution days and the execution time for a one-time schedule.

Use **undo time** to remove the execution time configuration for a schedule.

## Syntax

**time once at** *time* [ **month-date** *month-day* | **week-day** *week-day*&<1-7> ]

**time once delay** *time*

**undo time**

## Default

No execution time or day is specified for a schedule.

## Views

Schedule view

## Predefined user roles

network-admin

## Parameters

**at** *time*: Specifies the execution time in the format *hh:mm*. The value *hh* value is in the range of 0 to 23. The *mm* value is in the range of 0 to 59.

**month-date** *month-day*: Specifies a day in the current month, in the range of 1 to 31. If you specify a day that does not exist in the current month, the configuration takes effect on that day in the next month.

**week-day** *week-day*&<1-7>: Specifies a space-separated list of up to seven week days for the schedule. Valid values include **Mon**, **Tue**, **Wed**, **Thu**, **Fri**, **Sat**, and **Sun**.

**delay** *time*: Specifies the delay time for executing the schedule, in the format *hh:mm* or *mm*. This argument can consist up to 6 characters. When in the format *hh:mm*, *mm* must be in the range of 0 to 59.

## Usage guidelines

If the specified time has already occurred, the schedule will be executed at the specified time the following day.

If the day in the month has already occurred, the schedule will be executed at the specified day in the following month.

If the specified day in a week has already occurred, the schedule will be executed at the specified day in the following week.

The **time at** command, the **time once** command, and the **time repeating** command overwrite one another. The most recently configured command takes effect.

## Examples

# Configure the device to execute schedule **saveconfig** once at 15:00.

```
<Sysname> system-view
[Sysname] scheduler schedule saveconfig
[Sysname-schedule-saveconfig] time once at 15:00
Schedule starts at 15:00 5/11/2011.
```

# Configure the device to execute schedule **saveconfig** once at 15:00 on the coming 15th day in a month.

```
<Sysname> system-view
[Sysname] scheduler schedule saveconfig
[Sysname-schedule-saveconfig] time once at 15:00 month-date 15
```

# Configure the device to execute schedule **saveconfig** at 12:00 p.m. on the coming Monday and Friday.

```
<Sysname> system-view
[Sysname] scheduler schedule saveconfig
[Sysname-schedule-saveconfig] time once at 12:00 week-day mon fri
```

# Configure the device to execute schedule **saveconfig** after 10 minutes.

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

```
[Sysname] scheduler schedule saveconfig
[Sysname-schedule-saveconfig] time once delay 10
```

### Related commands

**scheduler schedule**

# time repeating

Use **time repeating** to specify an execution time table for a periodic schedule.

Use **undo time** to remove the execution time configuration for a schedule.

### Syntax

**time repeating** [ **at** *time* [ *date* ] ] **interval** *interval-time*

**time repeating at** *time* [ **month-date** [ *month-day* | **last** ] | **week-day** *week-day*&<1-7> ]

**undo time**

### Default

No execution time table is specified for a schedule.

### Views

Schedule view

### Predefined user roles

network-admin

### Parameters

**at** *time*: Specifies the execution time in the format *hh:mm*. The *hh* value is in the range of 0 to 23. The *mm* value is in the range of 0 to 59. If you do not specify this option, the current system time is used as the execution time.

*date*: Specifies the start date for the periodic schedule, in the format *MM/DD/YYYY* or *YYYY/MM/DD*. The *YYYY* value is in the range of 2000 to 2035. The *MM* value is in the range of 1 to 12. The value range for *DD* varies by month. If you do not specify this argument, the execution start date is the first day when the specified time arrives.

**interval** *interval-time*: Specifies the execution time interval in the format *hh:mm or mm*. This argument can consist up to 6 characters. When in the format *hh:mm*, *mm* must be in the range of 0 to 59. When in the format *mm*, this argument must be equal to or greater than 1 minute.

**month-date** [ *month-day* | **last** ]: Specifies a day in a month, in the range 1 to 31. The **last** keyword indicates the last day of a month. If you specify a day that does not exist in a month, the configuration takes effect on that day in the next month.

**week-day** *week-day*&<1-7>: Specifies a space-separated list of up to seven week days. Valid values include **Mon**, **Tue**, **Wed**, **Thu**, **Fri**, **Sat**, and **Sun**.

### Usage guidelines

The **time repeating** [ **at** *time* [ *date* ] ] **interval** *interval-time* command configures the device to execute a schedule at an interval from the specified time on.

The **time repeating at** *time* [ **month-date** [ *month-day* | **last** ] | **week-day** *week-day*&<1-7> ] command configures the device to execute a schedule at the specified time on every specified day in a month or week.

The **time at** command, the **time once** command, and the **time repeating** command overwrite one another, whichever is configured most recently takes effect.

## Examples

\# Configure the device to execute schedule **saveconfig** once a hour from 8:00 a.m. on.

```
<Sysname> system-view
[Sysname] scheduler schedule saveconfig
[Sysname-schedule-saveconfig] time repeating at 8:00 interval 60
```

\# Configure the device to execute schedule **saveconfig** at 12:00 p.m. every day.

```
<Sysname> system-view
[Sysname] scheduler schedule saveconfig
[Sysname-schedule-saveconfig] time repeating at 12:00
```

\# Configure the device to execute schedule **saveconfig** at 8:00 a.m. on the 5th of every month.

```
<Sysname> system-view
[Sysname] scheduler schedule saveconfig
[Sysname-schedule-saveconfig] time repeating at 8:00 month-date 5
```

\# Configure the device to execute schedule **saveconfig** at 8:00 a.m. on the last day of every month.

```
<Sysname> system-view
[Sysname] scheduler schedule saveconfig
[Sysname-schedule-saveconfig] time repeating at 8:00 month-date last
```

\# Configure the device to execute schedule **saveconfig** at 8:00 a.m. every Friday and Saturday.

```
<Sysname> system-view
[Sysname] scheduler schedule saveconfig
[Sysname-schedule-saveconfig] time repeating at 8:00 week-day fri sat
```

## Related commands

**scheduler schedule**

# transceiver phony-alarm-disable

Use **transceiver phony-alarm-disable** to disable alarm traps for transceiver modules.

Use **undo transceiver phony-alarm-disable** to restore the default.

## Syntax

**transceiver phony-alarm-disable**

**undo transceiver phony-alarm-disable**

The following matrix shows the support of MSR routers for the command:

| Hardware | Command compatibility |
|----------|----------------------|
| MSR1000 | No |
| MSR2000 | No |
| MSR3000 | Yes |
| MSR4000 | Yes |

## Default

Alarm traps are enabled for transceiver modules.

## Views

System view

## Predefined user roles

network-admin

## Usage guidelines

If you install a transceiver module that has no vendor name or has a vendor name other than HP, the system repeatedly outputs traps and logs to notify you to replace the module. To continue to use a transceiver module that is manufactured or customized by HP but has no vendor information, you can disable alarm traps so the system stops outputting alarm traps.

## Examples

# Disable alarm traps for transceiver modules.

```
<Sysname> system-view
[Sysname] transceiver phony-alarm-disable
```

# usb disable

Use **usb disable** to disable all USB interfaces.

Use **undo usb disable** to enable all USB interfaces.

## Syntax

**usb disable**

**undo usb disable**

## Default

All USB interfaces are enabled.

## Views

System view

## Predefined user roles

network-admin

## Usage guidelines

You can use USB interfaces to upload or download files or to connect a 3G modem. By default, all USB interfaces are enabled.

## Examples

# Enable all USB interfaces.

```
<Sysname> system-view
[Sysname] undo usb disable
```

# user-role

Use **user-role** to assign user roles to a schedule.

Use **undo user-role** to remove user roles from a schedule.

## Syntax

**user-role** *role-name*

**undo user-role** *role-name*

## Default

A schedule has the user roles of the schedule creator.

## Views

Schedule view

## Predefined user roles

network-admin

## Parameters

*role-name*: Specifies a user role name, a case-sensitive string of 1 to 63 characters. The user role can be user-defined or predefined. Predefined user roles include network-admin, network-operator, and level-0 to level-15.

## Usage guidelines

By assigning user roles to and removing user roles from a schedule, you can control the commands to be executed in a schedule.

A schedule must have one or more user roles, and can have up to 64 user roles. A command in a schedule can be executed if it is permitted by one or more user roles of the schedule.

For more information about user roles, see the RBAC configuration in *Fundamentals Configuration Guide*.

## Examples

# Assign user role **rolename** to schedule **test**.

```
<sysname> system-view
[Sysname] scheduler schedule test
[Sysname-schedule-test] user-role rolename
```

## Related commands

- **command**
- **scheduler schedule**

# Tcl commands

## tclsh

Use **tclsh** to enter Tcl configuration view from user view.

### Syntax

**tclsh**

### Views

User view

### Predefined user roles

network-admin

### Usage guidelines

In Tcl configuration view, you can execute the following commands:

- All Tcl 8.5 commands.
- Comware commands. The Tcl configuration view is equivalent to the user view. You can use Comware commands in Tcl configuration view in the same way they are used in user view.

### Examples

\# Enter Tcl configuration view from user view.

```
<Sysname> tclsh
<Sysname-tcl>
```

### Related commands

**tclquit**

## tclquit

Use **tclquit** to return from Tcl configuration view to user view.

### Syntax

**tclquit**

### Views

Tcl configuration view

### Predefined user roles

network-admin

### Usage guidelines

To return from Tcl configuration view to user view, you can also use the **quit** command.

To return to the upper-level view from the system view or a Comware feature view, use the **quit** command.

## Examples

# Return from Tcl configuration view to user view.

```
<Sysname-tcl> tclquit
<Sysname>
```

## Related commands

**tclsh**

# Support and other resources

## Contacting HP

For worldwide technical support information, see the HP support website:

http://www.hp.com/support

Before contacting HP, collect the following information:

- Product model names and numbers
- Technical support registration number (if applicable)
- Product serial numbers
- Error messages
- Operating system type and revision level
- Detailed questions

## Subscription service

HP recommends that you register your product at the Subscriber's Choice for Business website:

http://www.hp.com/go/wwalerts

After registering, you will receive email notification of product enhancements, new driver versions, firmware updates, and other product resources.

# Related information

## Documents

To find related documents, browse to the Manuals page of the HP Business Support Center website:

http://www.hp.com/support/manuals

- For related documentation, navigate to the Networking section, and select a networking category.
- For a complete list of acronyms and their definitions, see *HP FlexNetwork Technology Acronyms.*

## Websites

- HP.com http://www.hp.com
- HP Networking http://www.hp.com/go/networking
- HP manuals http://www.hp.com/support/manuals
- HP download drivers and software http://www.hp.com/support/downloads
- HP software depot http://www.software.hp.com
- HP Education http://www.hp.com/learn

# Conventions

This section describes the conventions used in this documentation set.

## Command conventions

| Convention | Description |
|---|---|
| Boldface | **Bold** text represents commands and keywords that you enter literally as shown. |
| *Italic* | *Italic* text represents arguments that you replace with actual values. |
| [ ] | Square brackets enclose syntax choices (keywords or arguments) that are optional. |
| { x \| y \| ... } | Braces enclose a set of required syntax choices separated by vertical bars, from which you select one. |
| [ x \| y \| ... ] | Square brackets enclose a set of optional syntax choices separated by vertical bars, from which you select one or none. |
| { x \| y \| ... } * | Asterisk-marked braces enclose a set of required syntax choices separated by vertical bars, from which you select at least one. |
| [ x \| y \| ... ] * | Asterisk-marked square brackets enclose optional syntax choices separated by vertical bars, from which you select one choice, multiple choices, or none. |
| &<1-n> | The argument or keyword and argument combination before the ampersand (&) sign can be entered 1 to n times. |
| # | A line that starts with a pound (#) sign is comments. |

## GUI conventions

| Convention | Description |
|---|---|
| **Boldface** | Window names, button names, field names, and menu items are in bold text. For example, the **New User** window appears; click **OK**. |
| > | Multi-level menus are separated by angle brackets. For example, **File** > **Create** > **Folder**. |

## Symbols

| Convention | Description |
|---|---|
| ⚠ WARNING | An alert that calls attention to important information that if not understood or followed can result in personal injury. |
| △ CAUTION | An alert that calls attention to important information that if not understood or followed can result in data loss, data corruption, or damage to hardware or software. |
| ① IMPORTANT | An alert that calls attention to essential information. |
| NOTE | An alert that contains additional or supplementary information. |
| ◌ TIP | An alert that provides helpful information. |

## Network topology icons

| | |
|---|---|
| | Represents a generic network device, such as a router, switch, or firewall. |
| | Represents a routing-capable device, such as a router or Layer 3 switch. |
| | Represents a generic switch, such as a Layer 2 or Layer 3 switch, or a router that supports Layer 2 forwarding and other Layer 2 features. |
| | Represents an access controller, a unified wired-WLAN module, or the switching engine on a unified wired-WLAN switch. |
| | Represents an access point. |
| | Represents a 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 card, such as a firewall, load-balancing, NetStream, SSL VPN, IPS, or ACG card. |

## Port numbering in examples

The port numbers in this document are for illustration only and might be unavailable on your device.

# Index