



Hewlett Packard
Enterprise

HPE Composable Fabric Module 5.0
Administrator Guide using Linux and CLI

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THIS PRODUCT COMPLIES WITH FDA RULE 21 CFR SUBCHAPTER J IN EFFECT AT DATE OF MANUFACTURE. PRODUCT COMPLIES WITH 21 CFR 1040.10 AND 1040.11

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APPAREIL À LASER DE CLASSE 1

This unit is intended to be installed in a Restricted Access Location only with access only by trained personnel.



Warning: The primary hazards of exposure to invisible laser radiation from an optical fiber communications system are:

- Damage to the eye by viewing an unterminated optical fiber or fiber optic connector.
- Damage to the eye from invisible laser radiation from viewing a cut fiber or a broken fiber.

Never attempt to view optical connectors that may be emitting laser energy and always avoid possible exposure to invisible optical laser radiation. Using optical fiber scopes or magnifying lenses may increase the possibility for an eye hazard. It is recommended that you use an optical power meter to determine if there is optical laser radiation present or use a remote video display inspection tool to inspect connectors.



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About This Document

This document describes HPE Composable fabric module administration tasks and commands/functions that are performed at either the Debian Linux Bash prompt or at a command line interface (CLI) prompt.

The CLI is used for some feature configurations and troubleshooting. You can use the CLI to access information available from Composable Fabric Manager and to display system status.

Note: Some fabric module configurations can be performed using the CLI; however, HPE recommends using the Composable Fabric Manager user interface (UI) for all fabric module configuration tasks.

From the Linux prompt, you can configure static IP addresses when initially setting up the fabric module. If you are using DHCP, the fabric module is ready to communicate with HPE Composable Fabric Manager when first installed.

Related Documentation

In addition to this document, refer to the following documentation:

- *HPE Composable Fabric 5.0 Release Notes*
- *HPE Composable Fabric 5.0 Support Matrix* which contains version-specific software and hardware support information, including cable and transceiver support information.
- *HPE Composable Fabric Manager 5.0 Installation Guide*
- *HPE Composable Fabric 5.0 FM 3180 Fabric Module Installation Guide*
- *HPE Composable Fabric 5.0 FM 3032Q Fabric Module Installation Guide*
- *HPE Composable Fabric 5.0 FM 2072 Fabric Module Installation Guide*
- *HPE Composable Fabric Manager Online Help* which is available while logged into the HPE Composable Fabric Manager UI

Contacting HPE Networking Support

You can open a support case by contacting the HPE Advanced Support Center at 1-800-633-3600. Note that customers will be asked to provide their Support Agreement ID (SAID) so that the support agent can provide the full level of support to which the customer is entitled and see the details of the equipment covered. Alternatively, the customer could provide the serial number of the device under support.

You can also open a support case electronically through the HPE Support Center:

www.hpe.com/support/hpesc

Note: To log a case directly in HPE Support Center you will need both an HPE Passport account and a valid Service Agreement ID (SAID). In May 2019, legacy Plexxi customers will receive HPE SAID numbers for their existing Plexxi service agreements (see the “Support Service Contract Migration” section in this document).

1 Fabric Module Management Connections

Ports

You can connect to a fabric module to perform fabric module management using the following methods:

- connect via SSH through the management port
- connect a console system to the console port on the fabric module

IMPORTANT: If you are performing an initial setup of the fabric module, refer to Section 2, Initial Fabric Module Setup.

Serial Console Port

The serial console may be needed for part of the initial fabric module setup, for troubleshooting, or for general fabric module management using Linux and the CLI. For serial access, the console system must be connected to the console port on the fabric module. To connect to the serial console port, use the following settings:

- 115.2 Kbps
- 8 data bits
- 1 stop bit
- No Parity

SSH through Management Port

If a fabric module has undergone the initial module setup and if the management port is connected to a network for management, you can SSH remotely through the fabric module's management port.

IMPORTANT: If you are performing an initial setup of the fabric module, refer to Section 2, Initial Fabric Module Setup.

SSH Session opened from the HPE Composable Fabric Manager UI

You can open an SSH session from the HPE Composable Fabric Manager UI (User Interface) as described in the Online Help, which is accessible from the HPE Composable Fabric Manager UI.

Logging into the Fabric Module

When you connect to the fabric module, you are prompted for a username and password. The default values for the pre-configured administrator account are:

- username: `admin`
- password: `plexxi`

When you log in, you start in your home directory at `/home/<username>`.

At the shell prompt, you can:

- perform fabric module setup using `px-setup` utilities
- perform some fabric module configuration tasks using the CLI

2 Initial Fabric Module Setup

The HPE Composable Fabric Module is shipped configured to use DHCP. If you are installing the fabric module in an environment that uses DHCP and the DHCP server has been configured as needed, the module is ready to communicate with HPE Composable Fabric Manager. After the link is established, use the HPE Composable Fabric Manager UI to configure the fabric module (see the *HPE Composable Fabric Manager Online Help*).

If you are using static IP addresses, you must connect to the fabric module, log in to the Linux shell, and run the `px-setup` command to configure the module as described in the sections that follow. To connect to the fabric module, use one of the following methods:

- IPV6 link-local address: Connect to the same network that the fabric module's management port is connected to (see "Connect using an IPV6 Link-Local Address").
- Serial console: Connect to the fabric module console port (see "Connect using a Serial Console").

Note: If you are using DHCP and are unable to establish a connection between the fabric module and the HPE Composable Fabric Manager, connect to the fabric module, log in to the Linux shell, and run the `px-setup` command to verify that the module is configured to use DHCP (see “

Running px-setup”).

Connect using an IPV6 Link-Local Address

For an IPV6 link-local connection, you SSH into the fabric module through the network that is connected to the fabric module’s management port. The IP address of the fabric module is determined by its MAC address, which you can convert into a link-local address using any of the available online tools. The fabric module MAC address is located either on the label attached to the top of the module or on a pull tab located under the management panel on the back (power side) of the module.

The IPV6 link-local syntax is as follows:

```
username@ipv6-address + percent sign (%) + interface-id
```

where:

```
ipv6-address           Destination fabric module address  
interface-id          Source output interface ID
```

Example:

```
ssh admin@fe80::216:eaff:fe5f:4cad%eth1
```

Connect using a Serial Console

The console system must be connected to the console port on the fabric module. To connect to the serial console port, the following settings are needed:

- 115.2 Kbps
- 8 data bits
- 1 stop bit
- No Parity

Running px-setup

The `px-setup` utility simplifies the HPE Composable Fabric Module setup by eliminating the need to edit configuration files and restart services on the fabric module. The utility queries administrators for information, then configures the IP or hostname of the Composable Fabric Manager software, time zone, network address, default gateway, SNMP management, and several network services, including NTP and DNS.

The `px-setup` commands require root/sudo privilege to modify core services. For example, logged into the fabric module as admin:

```
$ sudo px-setup
```

To setup all fabric modules and all network characteristics for a new install, use `px-setup` without arguments:

```
$ sudo px-setup
```

For detailed information about the `px-setup` command, refer to the following section in `px-setup` on page 19.

Note: Instead of specifying the IP address or hostname of the Composable Fabric Manager server using the `px-setup` command, refer to the next section to configure the IP address or hostname of the Composable Fabric Manager server on the DHCP server. You only need to perform this step for the first fabric module installed in the fabric.

Connecting through the Management Interface

Connect to the fabric module using the `ssh` command. This requires that the MGMT port on the fabric module be connected and that you know the IP address of the fabric module management port (the address you just configured). To connect using the IPV6 link-local feature, see “Connect using an IPV6 Link-Local Address”.

Connect to the fabric module using `ssh` and log in using the default credentials. For example:

```
ssh admin@ipaddress
```

Reply as prompted; the default administrator login is:

Username: **admin**

Password: **plexxi**

This puts you at the Debian Linux prompt on the fabric module in the `/home/admin` directory.

Changing the admin User Password

You can change the password for the Linux admin user on any new fabric modules using the Linux `passwd` command while logged in as admin and at the Linux prompt on the module:

```
$ passwd
```

Accessing the CLI

Access the CLI as follows:

1. Open the CLI Shell. At the Bash prompt, enter the following `sudo` command and then enter the password for admin:

```
admin@cfmod1:~$ sudo px-shell
```

This opens the EXEC Mode prompt:

```
cfmod1>
```

For example:

```
admin@ cfmod1:~$ sudo px-shell
[sudo] password for admin:
.
.
.
cfmod1>
```

2. Enter the PRIVILEGED EXEC mode from the EXEC mode by entering the `enable` command. For example, on fabric module **cfmod1**:

```
cfmod1> enable
cfmod1#
```

The prompt changes from `>` to `#`.

Saving the Configuration

An asterisk preceding the prompt indicates that the configuration has changed but was not saved. In the PRIV-EXEC mode (`#` prompt), save the new configuration settings to the fabric module, enter the command:

```
*cfmod1# copy running-config startup-config
Building configuration...
[OK]
cfmod1#
```

Upgrading Fabric Module Software

You might need to upgrade to the latest version of the fabric module software when you initialize the module for the first time. Refer to the *Composable Fabric Manager UI and Online Help*.

3 Fabric Module Configuration Utilities

Some fabric module-specific configuration settings are accomplished using the `px-` utilities that are available from the Linux shell prompt and described in the sections that follow.

CAUTION: System changes made with the `px-` utilities may be overwritten by changes made using the Composable Fabric Manager UI.

IMPORTANT: Man pages are available for `px-` utilities.

Running Utilities

To run the utilities:

1. Connect to the fabric module using `ssh` and log in using the default credentials using the following command:

```
ssh admin@ipaddress
```

For example:

```
ssh admin@192.168.1.2
```

In the above command, you can specify the hostname rather than the IP address, as follows:

```
ssh admin@hostname
```

For example:

```
ssh admin@sw2
```

2. Reply as prompted. The default administrator login is:

Username: **admin**

Password: **plexxi**

3. This puts you at the Debian Linux prompt on the fabric module in the `/home/admin` directory.
4. Change directory to the root directory:

```
cd /
```

5. At the prompt, enter a utility command. For example:

```
$ px-topology --info
```

6. To get a man page for a utility command, enter the following command:

```
$ man command_name
```

For example:

```
$ man px-adduser
```

px-adduser

Add a User

The `px-adduser` utility enables you to easily create accounts that adhere to fabric module user roles and is accessible in the fabric module Bash environment; it is not available from the `px-shell` CLI.

Note: It is not mandatory that you use this utility to create fabric module user accounts - it just makes it easier.

Syntax

```
px-adduser <username>  
px-adduser [--user-role administrator|operator|viewer] [--full-name <name>] <user_name>  
px-adduser [--disabled-login] <user_name>
```



```
px-adduser [-h|--help]
```

Helper utility for creating local user accounts that adhere to defined user roles.

Options

- `-h, --help` Display help for this command.
- `--user-role role` Specify the role for this account: administrator, operator or viewer.
- `--full-name name` Indicate the full name of this user or any comment for the account.
- `--disabled-login` Create the account without prompting for the initial password.

Issuing this command with only the `user_name` argument prompts you to enter the user role, full name and password for this new account.

The optional parameters listed above can be passed to avoid entering settings interactively.

Note: The password cannot be passed on the command line. You can use the `disabled-login` option to create the account initially disabled, then later, use the `passwd` command to set the initial password and enable the account.

User Roles

The following user roles are supported:

- **Administrator** - This role has the highest privileges on the system. It equates, indirectly, to superuser access. User accounts of this role have:
 - Membership in group `px_administrator`; this group has sudo access to all system commands
 - Default shell is `/bin/bash`
- **Operator** - This is the second highest privilege level. It allows for configuration changes in `px-shell`, but is more limited for the rest of the system. It has:
 - Membership in group `px_operator`; this group has sudo access only to `px-shell`.
 - Default shell is `/bin/bash`
- **Viewer** - This is the least privileged role. Users with this role are only allowed unprivileged access to `px-shell` and no access to Bash. It includes:
 - Membership in group `px_viewer`; this group has no sudo privileges
 - Default shell is `/bin/px-shell`

Examples

The following command, you are prompted for role, full name and initial password.

```
$ sudo px-adduser nemo
```

The following command generates no prompts and creates an operator account that is disabled:

```
$ sudo px-adduser --user-role operator --full-name "Dory fish" --disabled-login dory
```

The following command displays Help for the `px-adduser` command:

```
$ sudo px-adduser --help
```

Exit Status

This utility essentially calls the `useradd` command, followed by the `passwd` command (unless opted out). If either of these exhibit an error, their status is propagated out by this utility. See `useradd(8)` and `passwd(1)` for more details on their status codes.

Scripting

It may be desirable to script the creation of accounts. This can be accomplished by using the optional `--user-role` and `--full-name` arguments to pass the information normally prompted for. The password cannot be passed on the command line - it could be visible to other users in the process listing. Instead,

the `--disabled-login` option can be passed, and the account gets created in an initially disabled state. Later on, `/usr/bin/passwd` can be used to set the initial password and enable the account.

px-hostname

Configure the Fabric Module Host Name

The standard Linux `hostname` command does not make a persistent change to the fabric module hostname. To make a persistent fabric module hostname change, use the `px-hostname` utility from BASH. When using the `px-hostname` command to change the hostname of the fabric module, the command must be run as 'root' (with 'sudo').

Note: The host name becomes part of the Linux and CLI command prompts on the next login.

Syntax

```
px-hostname
px-hostname <new_host_name> [-y|--yes-restart]
px-hostname -h|--help
```

Options:

| | |
|--------------------------------|--|
| <code>-h, --help</code> | Print help for this command. |
| <code>-y, --yes-restart</code> | Proceed with the hostname change without prompting. When you configure the fabric module hostname, various services are restarted. |

Therefore,

you will be prompted to continue. You can avoid the prompt by entering `-y` or `--yes-restart` as a command argument.

`px-hostname` with no arguments returns the current active hostname.

`px-hostname` with a new hostname persistently applies the new hostname to the fabric module.

px-log-bundle

Generate log bundle

The `px-log-bundle` utility allows users to retrieve a log bundle from a specified fabric module. The output file has the format `HOSTNAME-YYYYMMDD-HHMM-sw-log-bundle.tar.gz` and contains log files for a fabric module that are newer than the specified or default (24 hours) time.

Syntax

```
px-log-bundle [-h] [-v] [-d days | -H hours | -f [YYYY][MM][DD]hhmm]
```

Optional Arguments

| | |
|---|--|
| <code>-h --help</code> | Display help for this command. |
| <code>-d --days=(days)</code> | Include files newer than number of days before now. |
| <code>-f --format=[YYYY][MM][DD]hhmm</code> | Include files newer than the specified date/time: YYYY 4-digit year MM 2-digit month DD 2-digit day hhmm Hour and minute |
| <code>-H --hours=(hours)</code> | Include files newer than number of hours before now. |

`-v|--verbose` Run in verbose mode. Can be used with `[-d days | -H hours | -f [YYYY] [MM] [DD] hhmm]` or with no other options (which collects logs from the previous 24 hours).

Examples

The following command generates a log bundle containing data from the last 36 hours:

```
$ px-log-bundle -H 36
```

The following command generates a log bundle containing data from the last 30 days:

```
$ px-log-bundle -d 30
```

The following command generates a log bundle containing data starting at 1:00 April 27, 2018:

```
$ px-log-bundle -f 201804270100
```

px-lspart

Display Install Partition Information

The `/usr/bin/px-lspart` utility lists the installed software version for each of the install partitions (A and B). It also indicates which partition is currently running ('r' is shown next to the partition) and which partition is currently the default boot partition ('b' is shown next to the partition).

Syntax

```
px-lspart  
px-lspart -h|--help
```

Options

`-h, --help` Display a help summary.

Notes

If the alternate partition is not mounted, an error is given indicating as such. The command relies on `/alt` being mounted.

Also, the version strings shown are those for the install package that was installed to the partition (either via ONIE or HPE upgrade). If you need to know more granular information about specific package versions, try the `'px-package-check'` or `'dpkg'` commands.

px-package-check

List Installed Software Packages

The `px-package-check` utility returns a report of any packages that have been added, removed, or updated since the current partition was installed.

Syntax

```
px-package-check [-h] [-e] [-i] [-r] [-u]
```

Optional Arguments

| | |
|---|---|
| <code>-h</code> or <code>--help</code> | Show help for this command. |
| <code>-e</code> or <code>--errors</code> | List error conditions. Returns the name, version, and status. |
| <code>-i</code> or <code>--installed</code> | List packages installed since initial install. Returns the name and version. |
| <code>-r</code> or <code>--removed</code> | List packages removed since initial install. Returns the name and version. |
| <code>-u</code> or <code>--upgraded</code> | List packages upgraded since initial install. Returns the name, original version and current version. |

If no arguments are passed, the `px-package-check` utility lists the following:

- packages that do not appear to be fully installed.

- packages that have been added since the initial installation
- packages that have been removed since the initial installation
- packages that have upgraded (or otherwise changed version) since the initial installation

This utility does not detect reinstallation or reconfiguration of packages.

Note: You can also refer to the 'dpkg-query' command and the /var/log/dpkg.log file.

px-setup

Fabric Module Setup

The `px-setup` utility simplifies the initial fabric module setup, forgoing the need to configure many files on many systems for the basic network parameters (hostname/address) necessary to begin full communication between devices.

The `px-setup` commands require root/sudo privilege to modify core services. For example, logged into the fabric module as admin:

```
$ sudo px-setup
```

To setup all fabric modules and all network characteristics for a new install, use `px-setup` without arguments:

```
$ sudo px-setup
```

To setup a new fabric module added to an existing fabric, use `px-setup` and define the fabric module by its MAC address:

```
$ sudo px-setup -t MAC_Address
```

Note: `px-setup` uses UTC by default for time zone. HPE recommends that you use UTC for fabric modules and the Composable Fabric Manager.

IMPORTANT: HPE recommends that Composable Fabric Manager and all fabric modules be connected to a reliable NTP service.

Determining Your Operating Environment

Determine whether the installed fabric modules will use static IP addresses or DHCP.

Note: The HPE Composable Fabric Module is shipped configured to use DHCP.

For static IP, run `px-setup` without arguments to configure all parameters.

```
$ sudo px-setup
```

For DHCP, determine which services DHCP configures in your environment, and which services you configure with `px-setup`. Refer to the Syntax below.

Syntax

```
px-setup  
px-setup [-t fabric module,...,fabric module]  
px-setup --help
```

| Command | Function |
|---------------------|---|
| px-setup | <p>Entering <code>px-setup</code> with no arguments queries for all service information and applies the configuration to all fabric modules in the fabric.</p> <p>You can answer 'n' to omit service queries as they are prompted.</p> <p>With no arguments, it configures ALL fabric modules discovered by census info; in other words, all fabric modules properly connected and detected on the fabric.</p> |
| px-setup-controller | <p>Configure the fully-qualified host name or IP address of the Composable Fabric Manager server. This value was assigned when you deployed Composable Fabric Manager on the Composable Fabric Manager host.</p> <p>Note: This command is not supported. Use the HPE Composable Fabric Manager UI for configuring this setting (see the <i>HPE Composable Fabric Manager UI Guide</i>). The value assigned to this setting using the HPE Composable Fabric Manager UI overrides any value assigned to the setting using the <code>px-setup</code> utility.</p> |
| px-setup-hostaddr | <p>Configure the host name and management IP address for each fabric module being configured.</p> <p>Note: This command is not supported. Use the HPE Composable Fabric Manager UI for configuring this setting (see the <i>HPE Composable Fabric Manager UI Guide</i>). The value assigned to this setting using the HPE Composable Fabric Manager UI overrides any value assigned to the setting using the <code>px-setup</code> utility.</p> |
| px-setup-tz | <p>Set the time zone for each fabric module being configured.</p> <p>Note: <code>px-setup</code> uses UTC by default for time zone. HPE recommends that you use UTC for fabric modules and Composable Fabric Manager.</p> <p>Note: This command is not supported. Use the HPE Composable Fabric Manager UI for configuring this setting (see the <i>HPE Composable Fabric Manager UI Guide</i>). The value assigned to this setting using the HPE Composable Fabric Manager UI overrides any value assigned to the setting using the <code>px-setup</code> utility.</p> |
| px-setup-ntp | <p>Configure NTP for each fabric module being configured.</p> <p>Note: This command is not supported. Use the HPE Composable Fabric Manager UI for configuring this setting (see the <i>HPE Composable Fabric Manager UI Guide</i>). The value assigned to this setting using the HPE Composable Fabric Manager UI overrides any value assigned to the setting using the <code>px-setup</code> utility.</p> |
| px-setup-dns | <p>Configure DNS for each fabric module being configured.</p> <p>Note: This command is not supported. Use the HPE Composable Fabric Manager UI for configuring this setting (see the <i>HPE Composable Fabric Manager UI Guide</i>). The value assigned to this setting using the HPE Composable Fabric Manager UI overrides any value assigned to the setting using the <code>px-setup</code> utility.</p> |
| px-setup-snmp | <p>Configure SNMP for each fabric module being configured.</p> <p>Note: This command is not supported. Use the HPE Composable Fabric Manager UI for configuring this setting (see the <i>HPE Composable Fabric Manager UI Guide</i>). The value assigned to this setting using the HPE Composable Fabric Manager UI overrides any value assigned to the setting using the <code>px-setup</code> utility.</p> |

Options

| | |
|-------------------------------|--|
| <code>-t MAC, ..., MAC</code> | Specify one or more fabric modules to configure. This is a comma delimited (no spaces) list of MAC address which uniquely identify the fabric modules. If one or more fabric modules is specified using the -t, only the listed modules are configured and only questions that apply to those fabric modules will be posed. This option is recommended to configure an individual fabric module or multiple modules of a similar class (city, service-type, and so on). |
| <code>--help</code> | Display a help summary. |

Examples

| | |
|--|---|
| <code>\$ sudo px-setup</code> | This asks a series of questions about all detectable fabric modules and common services, then applies the configuration to the modules. |
| <code>\$ sudo px-setup -t 01:02:03:aa:bb:cc</code> | This prompts and collects configuration information for a specified fabric module (01:02:03:aa:bb:cc) identified by its unique base MAC address. The configuration is applied to the specified module only. |
| <code>\$ sudo px-setup -t 01:02:03:aa:bb:cc,55:44:ff:ee:bb:00</code> | Specifies two fabric modules. The utility queries about all services common to the specified modules, then applies the configuration on the specified modules. |
| <code>\$ sudo px-setup --help</code> | Displays a help summary. |

Notes

The `px-setup` commands create a set of backup files of the puppet manifests it utilizes to distribute and apply the configuration. These are stored in the `/var/opt/px-setup-backups` directory in a subdirectory which uses a date-time format such as `2017-05-10_20-27`. This directory is populated with configuration data (in an intermediary state) on all systems where the configuration is to be applied. To prevent disk over-usage, a limited set of backup files is retained. If an automated backup system is in place, it is advisable to collect the data in these directories.

The `px-setup` commands keep the output simple and clean. More detailed debug information can be found in `/var/log/px-setup.log`. This log is only produced on the fabric module where `px-setup` was executed. It is unique per fabric module and not shared or distributed.

px-ssl-install

Install an SSL Certificate and Keys

The px-ssl-install utility enables administrators to install their own custom certificates and key pairs on the fabric module. This tool places the files in the correct place in the file system and restarts the Composable Fabric client so that the client can import the certificate and keys.

Syntax

```
px-ssl-install <cert> <key>  
px-ssl-install -h | --help
```

Where:

| | |
|------------|---|
| <cert> | The path and name for the certificate file. Needs to be in curl format. |
| <key> | The path and name for the key file. Needs to be in curl format. |
| -h, --help | Display help for this command. |

Examples

The following command installs from local files:

```
$ px-ssl-install file:///<certfile>.pem file:///<keyfile>.pem
```

The following command installs from a Web server:

```
$ px-ssl-install Error! Hyperlink reference not valid.  
http://<webserver>/<keyfile>.pem
```

px-sslgen

Generate a Pair of Self-Signed SSL Keys

The px-sslgen utility generates two self-signed SSL keys for the fabric module, one private key and one public key. All fields in the px-sslgen command are optional. The tool generates SSL certificates with default values.

Syntax

```
px-sslgen -o | --output <output>  
px-sslgen -c | --country <country>  
px-sslgen -st | --state <state>  
px-sslgen -l | --location <location>  
px-sslgen -org | --organization <organization>  
px-sslgen -cn | --cname <cname>  
px-sslgen -em | --email <email>  
px-sslgen -a | --altname <alternate name>  
px-sslgen -ex | --expires <expires>  
px-sslgen -fp | --fileprefix <fileprefix>  
px-sslgen -h | --help
```

Optional Arguments

| | |
|----------------------|--|
| -o, --output | The --output option specifies an optional output location. The default location is “simple1”. |
| -c, --country | The --country option specifies a value for the optional country field in SSL keys. The default value is US. |
| -st, --state | The --state option specifies a value for the optional state field in SSL keys. The default value is New Hampshire. |
| -l, --location | The --location option specifies a value for the optional location field in SSL keys. The default value is Nashua. |
| -org, --organization | The --organization option specifies a value for the optional organization field in SSL keys. |

| | |
|--------------------------------|---|
| <code>-cn, --cname</code> | The <code>--cname</code> option specifies a value for the optional <code>cname</code> field in SSL keys. The default value is the system hostname. |
| <code>-em, --email</code> | The <code>--email</code> option specifies a value for the optional <code>email</code> field in SSL keys. |
| <code>-a, --altname</code> | The <code>--altname</code> option specifies a value for the optional alternate name field in SSL keys. The default value is derived from the system hostname, FQDN, and interface IP addresses. |
| <code>-ex, --expires</code> | The <code>--expires</code> option specifies a value for when the certificates expire in the <code>expires</code> field in SSL keys. The default value is 157680000 seconds (5 years). |
| <code>-fp, --fileprefix</code> | The <code>--fileprefix</code> option specifies a prefix used when generating output files. The default value is <code>server</code> . |
| <code>-h, --help</code> | Display help for this command. |

Examples

The following command generates two SSL keys, one private and one public, in the default directory `“simple1/”`:

```
$ px-sslgen
```

The following command generates two SSL keys, one private and one public, in the current directory:

```
$ px-sslgen --output "./"
```

px-topology

View and Diagnose the Composable Fabric Topology

The `px-topology` command can be used to view and diagnose the Composable Fabric topology.

Syntax

```
px-topology -s|--show residual
px-topology -s|--show vlan [vlan <VLAN>] [root <ROOT>]
px-topology -t|--trace residual
px-topology -t|--trace vlan <VLAN> [root <ROOT>]
px-topology -t|--trace attachments
px-topology -v|--validate
px-topology -e|--state residual
px-topology -e|--state vlan
px-topology -c|--control
px-topology -i|--info
px-topology -h|--help
```

Optional Arguments

| | |
|-----------------------------|--|
| <code>-s, --show</code> | The <code>--show</code> option displays the currently active paths from this fabric module to one or more root fabric modules in the Composable Fabric network. |
| <code>-t, --trace</code> | The <code>--trace</code> option sends trace packets from this fabric module to destination fabric modules on the residual or VLAN (ISO) topologies. When tracing, you can specify the <code>"attachments"</code> argument to simulate actual lookup failures to follow attachments from this fabric module to the root fabric modules the attachments reside on. |
| <code>-v, --validate</code> | The <code>--validate</code> option uses trace packets to test if the topology is healthy. It outputs a status message that indicates success or failure of the topology. |
| <code>-e, --state</code> | The <code>--state</code> option shows the state of active and backup paths for either the residual or VLAN (ISO) topologies. Failures are indicated in the output; for example, fabric module or uplink failures. |



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| | |
|----------------------------|--|
| <code>-c, --control</code> | Show the active list of fabric modules. |
| <code>-i, --info</code> | Show information on the state of the last fitting transaction. |
| <code>-h, --help</code> | Display help for this command. |
| <code>vlan</code> | The VLAN (ISO) option filters results for a specific VLAN or root fabric module. |

4 Managing Fabric Module User Accounts and Authentication

Local Fabric Module Authentication

Local Linux and CLI users can be created on each fabric module. Linux users can be created on the fabric module platform using the `px-adduser` utility. Each module user must be a member of one of the following **pre-defined groups** which give them their privileges:

IMPORTANT: Only an Administrator can create users.

px_administrator – This user Role provides root access to the fabric module through pre-arranged sudoers config file. Upon login, any `px_administrator` user has full administrator access to all Linux commands and utilities, via `sudo`.

px_operator – This Role provides normal, unprivileged access to the Linux system. It cannot, for example, create or edit user accounts. Upon login, a `px_operator` user has elevated `sudo` privileges for 'px-shell' only. In this way, the user has full configuration ability within the fabric module CLI.

px_viewer - This user Role provides only viewing access in the CLI, and NO access to Linux.

Adding a Local User Using the px-adduser Utility

Important: This is the preferred utility to use when adding a user.

Administrators can add a local user at the fabric module Linux prompt by using the `px-adduser` utility:

1. Create the user by issuing this command and following the prompts:

```
$ sudo px-adduser <username>
```

Important: The `px-adduser` utility is described in detail in Chapter 4, section, [Adding a User - px-adduser](#). This section also provides options on how to script `px-adduser` without user interaction.

2. Respond to the prompts, assigning the appropriate group (`px_administrator`, `px_operator`, or `px_viewer`)

Accessing the Composable Fabric CLI

As an Administrator

To access the CLI, at the Linux prompt on the fabric module, a user with Administrator role must execute the command:

```
$ sudo px-shell
```

In the CLI, this user has full configuration privileges. Upon exiting the CLI, this user is returned to their Linux shell until logout.

As an Operator

To access the CLI, at the Linux prompt on the fabric module, a user with Operator role must execute the command:

```
$ sudo px-shell
```

In the CLI, this user has full configuration privileges. Upon exiting the CLI, this user is returned to their Linux shell with read-only privileges until logout.

As a Viewer



Upon login, a user with Viewer role is placed directly in the CLI with Viewer privileges. Viewer users do not have Linux access.

5 Debian Linux Commands for Fabric Module Configuration

Some fabric module configuration settings are accomplished using Debian Linux commands as outlined in the sections that follow.

IMPORTANT: These commands are issued from the Linux Bash prompt and may require `sudo` to execute.

CAUTION: When Composable Fabric Manager is connected to the fabric module, it is very likely that any changes made in Linux will be overwritten by Composable Fabric Manager the next time it reboots.

Once CFM is connected, it is very likely that any changes made in Linux will be overwritten by CFM the next time it reboots.

NOTE: Refer to the Debian Linux man pages for command-specific information.

Manually Setting the Time and Date

You can manually set the time and date using the `date` command. For example:

```
$ sudo date 05041322
Thu May 4 13:22:00 EDT 2017
$
```

Refer to the man page `date[1]`.

Changing the Time Zone

To change the time zone, Debian recommends reconfiguring the 'tzdata' package which is done with the command:

```
$ sudo dpkg-reconfigure tzdata
```

When this is run, an interactive menu prompt is displayed for you to select the desired system time zone.

Setting Time Once with NTP

The NTP protocol can be configured to continually keep system time synchronized using an NTP server. To perform a one-time setting of system time based on an NTP server, the `ntpdate` command can be used **only if the NTP service is disabled**. For example, the following uses an NTP server at IP address 1.1.1.1:

```
$ sudo ntpdate 1.1.1.1
```

Refer to the man page `ntpdate(8)` for more details.

Configuring the IP Domain

To configure the IP domain, use the domain or search fields in the file:

```
/etc/resolv.conf
```

The following is a generic example of a `resolv.conf` file. You must fill in values that make sense for your environment:

```
$ cat /etc/resolv.conf

domain system.company.com
search system.company.com. company.com. system1.company.com.
nameserver 150.20.1.2
nameserver 10.10.10.10
```

```
nameserver 10.10.11.11  
nameserver 150.30.2.10
```

```
$
```

Refer to the `resolv(5)` man page.

The FQDN (fully-qualified domain name) should be set in the file:

```
/etc/hosts
```

Refer to the `hosts(5)` man page

All DNS settings are in the `/etc/resolv.conf` file.

Copying Files to a Fabric Module

You can copy files to the fabric module at the Linux prompt using the Linux `scp` command.

For example, to copy a file named `resolv.conf` from an admin workstation to a fabric module named **bb2** and save it as `my_resolv.conf`:

```
$ scp resolv.conf admin@bb2:~/my_resolv.conf  
admin@bb2's password:  
resolv.conf
```

Configuring SSH Keys on a Fabric Module

SSH Keys can be managed as follows.

Regenerating SSH Host Keys on a Fabric Module

You might need to regenerate SSH host keys on the fabric module as directed by IT policy or as otherwise needed. To regenerate SSH host keys on a fabric module at the Bash prompt on the module:

1. Delete the old SSH host keys:

```
$ sudo rm /etc/ssh/ssh_host_*
```

2. Reconfigure the OpenSSH server:

```
$ sudo dpkg-reconfigure openssh-server
```

3. Restart the SSH server:

```
$ sudo systemctl restart sshd
```

4. As needed, update SSH keys on any client hosts that will be used to log into the fabric module.

Starting or Stopping the SSH service on a Fabric Module

To start or stop the SSH service on the fabric module:

```
$ sudo systemctl start|stop sshd
```

Making SSH Persistent on a Fabric Module

To make SSH persistent on the fabric module:

```
$ sudo systemctl disable|enable sshd
```

Also refer to the Linux `systemctl(1)` man page.

6 Saving Configuration Changes

This section describes how to use the Composable Fabric Module CLI to save module configuration changes and view the current configuration.

Saving Configuration Changes

You need to save the configuration information you enter using the CLI to have the new configuration persist across fabric module reboots and software upgrades.

If the fabric module configuration is changed while in CONFIG mode, an asterisk precedes the prompt to indicate that the configuration has changed.

For example, the banner command makes a configuration change:

```
cfmod1(config)# banner motd "Hello, World"
*cfmod1(config)# exit
*cfmod1#
```

If you then save the running-config, the indicator disappears. To save your changes, use the following command:

```
*cfmod1# copy running-config startup-config
Building configuration...
[OK]
cfmod1#
```

The CLI parser accepts the shortest unambiguous substring for each command and parameter name. So the above will also work if all that is typed is copy run start.

Checking the Current Configuration

To check the current state of the system configuration for those elements configured by px-shell, in the PRIV-EXEC mode, enter the command:

```
cfmod1# show running-config
!
service password-encryption
!
ip domain-lookup
!
!
line con 0
  login
line vty 0 4
  login
!
end

cfmod1#
```

7 Handling Files

Handling Files from the Debian Linux Prompt

Copying Files from a Remote System

You can copy files from a remote system at the Linux prompt using the `scp` command.

Handling Files from the Composable Fabric CLI

In the PRIV-EXEC mode of the Composable Fabric CLI, you can manipulate and list files using the `copy`, `move`, `delete`, and `dir` commands available in that mode.

The CLI presents a local file system containing a single, unnamed directory. You cannot create or navigate nested directories. You can use the `dir` command to list the contents of the local file system:

```
cfmod1# dir
User Files:
-----
 243264462   May 2 2016 17:27   2.3.0
 380         May 6 2016 10:41   config
 434         March 30 2016 16:37 test_config
cfmod1#
```

- The first column shows the file size in bytes
- The second column shows the time/date the file was last written
- The third column shows the file name

running-config and startup-config

When working with files, note the following special names, which are not located in the visible local file system space:

- `running-config` refers to the current configuration
- `startup-config` refers to the saved configuration

Copy, Move, and Delete Examples

The following example shows the use of the `copy`, `move`, and `delete` commands in the PRIV-EXEC mode of the fabric module CLI.

```
cfmod1# delete test_config
cfmod1# dir
User Files:
-----
 243264462   May 2 2016 17:27   2.3.0
 380         May 6 2016 10:41   config
cfmod1# move config old_config
cfmod1# dir
User Files:
-----
 243264462   May 2 2016 17:27   2.3.0
 380         May 6 2016 10:41   old_config
cfmod1# copy running-config current_config
cfmod1# dir
User Files:
-----
 243264462   May 2 2016 17:27   3.0.0
 434         March 30 2016 16:44 current_config
 380         May 6 2016 10:41   old_config
cfmod1#
```

With that last example using `copy`, the current system configuration was built and saved to the destination filename.

File Copy with URL

The `copy` command can use URLs for either the source or destination (not both). Using URLs with the `copy` command lets you copy files from a remote file server to the local fabric module file system and vice versa.

URLs follow the general form:

```
protocol://[username[:password]@]host[:port]/path/filename
```

where username, password and port can be optionally included in the URL. The following protocols are supported:

- http
- scp
- sftp
- ftp
- tftp

SCP and SFTP

You could be prompted for either or both a username and password if they are not embedded in the given URL. You can opt to always leave the password information out of the URL so that it is not shown on the screen in plain text. When prompted for password information, the characters will not be echoed to the screen. For example:

```
cfmodl# copy current_config sftp://me@my_server/configs/my_cfmod/oct3_config
Password: *****
cfmodl#
```

```
cfmodl# copy scp://release_server/releases/*_3.0.0.tar.gz latest_release
Username: admin
Password: *****
cfmodl#
```

HTTP and FTP

A username and password might or might not be needed. You will not be prompted unless a username is embedded in the URL but no password is included.

TFTP

Any username or password info embedded in the URL is ignored.

8 CLI Modes

The Composable Fabric CLI can be accessed from the CLI Shell (px-shell).

The CLI contains the following modes:

- **EXEC** - The EXEC mode (also known as View mode) is the mode available when you first login to the CLI. You use this mode to perform basic commands. You cannot make any changes to the fabric module.
- **PRIV-EXEC** - PRIV-EXEC includes the EXEC commands plus additional configuration, debug, and cleanup commands. The PRIV-EXEC mode (also known as Enable mode), lets you issue debugging commands, write commands for saving and viewing the configuration, and issue additional show commands.
- **CONFIG** - mode: includes the commands from EXEC and PRIV-EXEC modes;
 - You must prefix EXEC and PRIV-EXEC commands with the word `do`. For example, to issue a PRIV- EXEC command `boot toggle`, from any CONFIG mode, you must use the syntax `do boot toggle`.
 - Configuration changes that you make in this mode are immediately saved to `running-config` and immediately take effect. However, these changes must be copied to `startup-config` for them to persist to subsequent fabric module reboots and software upgrades. Refer to 6, Saving Configuration Changes, page 28.
 - `running-config` is the current configuration and `startup-config` is the saved configuration.
- **CONFIG-LINE** - CONFIG-LINE is a sub-mode of CONFIG and is used to manage console and Virtual Terminal (VTY) lines.

NOTE: For prompts, this document uses a fabric module named `cfmod1` as the prompt example throughout.

Opening the CLI Shell

To open the CLI Shell, at the Bash prompt, enter the following `sudo` command and then enter the password for admin:

```
admin@module:~$ sudo px-shell
```

This opens a prompt such as:

```
cfmod1>
```

For example:

```
admin@cfmod1:~$ sudo px-shell
[sudo] password for admin:
. . .
cfmod1>
```

Entering the CLI Modes

Entering the EXEC Mode

When you open a px-shell session to a fabric module, you are automatically in the EXEC mode. The prompt is:

```
module>
```

For example, the prompt for a fabric module named **cfmod1**:

```
cfmod1>
```

Entering the PRIV-EXEC Mode

To enter the PRIVILEGED EXEC mode, from the EXEC mode, enter the `enable` command. For example, on fabric module **cfmod1**:

```
cfmod1> enable  
cfmod1#
```

The prompt changes from `>` to `#`.

Note: To return to EXEC mode, use the 'disable' command.

Note: If px-shell is not invoked using 'sudo', such as would be the case for a Viewer user account whose default shell is `/bin/px-shell`, then the 'enable' command is ineffective and elevated modes are not accessible.

Entering the CONFIG Mode

To enter the CONFIG mode, from the PRIV-EXEC mode, enter the `configure` command. For example, on fabric module `cfmod1`:

```
cfmod1# configure  
cfmod1 (config) #
```

Entering the CONFIG-LINE Mode

To enter the CONFIG-LINE mode, from the CONFIG mode, enter the `line console #` command. For example, for console line 0:

```
cfmod1 (config) # line console 0  
cfmod1 (config-line) #
```

Exiting the CONFIG-LINE Mode

To exit the CONFIG-LINE mode and return to the PRIV-EXEC mode, enter the `end` command:

```
cfmod1 (config-line) # end  
cfmod1#
```

Exiting the CLI Modes

Returning to the Previous CLI Mode

To exit any mode and return to the previous mode, enter **CTRL-Z**, **CTRL-D**, **quit** or **exit**. If in the CONFIG mode, you will return to the PRIV-EXEC mode. If in either CONFIG-IF or CONFIG-LINE mode, you return to the CONFIG mode.

NOTE: Entering any of these commands from the PRIV-EXEC mode will exit the CLI session.

Returning to the PRIV-EXEC Mode

To return to the PRIV-EXEC mode from any mode (except EXEC), enter the **end** command. For example:

```
cfmod1 (config) # end
cfmod1 #
```

Exiting the CLI Shell to Bash

To exit the CLI Shell and return to the Bash prompt, you need to return to the PRIV-EXEC mode.

From the config mode, to return to the PRIV-EXEC mode:

```
cfmod1 (config) # exit
cfmod1 #
```

From the PRIV-EXEC mode, to exit the fabric module Shell and return to the Bash prompt:

```
cfmod1 # logout
admin@cfmod1:~$
```

9 CLI Help and Modifiers

This section describes the available CLI tools.

CLI Help

The CLI includes a help system. You can type a question mark (?) at the prompt to display a list of available commands. For example:

```
cfmodl# ?
Exec commands:
  clear          Reset functions
  debug          Debugging functions (see also 'undebug')
  disable        Turn off privileged mode command
  enable         Turn on privileged mode command
  exit           End current mode and down to previous mode
  get            Show running system information
  help           Description of the interactive help system
  logout         Exit from the EXEC
  no             Negate a command or set its defaults
  ping           Send echo messages
  quit           Exit current mode and down to previous mode
  reset          Reset command
  show           Show running system information
  ssh           Open an SSH connection
  telnet         Open a telnet connection
  terminal        Set terminal line parameters
  trace-attachment Trace a MAC attachment to its source and the path it takes
  traceroute     Trace route to destination
  undebug        Disable debugging functions (see also 'debug')
```

```
cfmodl#
```

You can also get help for a specific command by typing the command name followed by ?. The next expected parameters for that command are displayed. A <cr> indication means you can complete the command by typing Enter. For example:

```
cfmodl# show ?
  bgp          Border Gateway Protocol (BGP)
  boot         Display partition install and boot setup
  cli          Show CLI tree of current mode
  clns         Connectionless-Mode Network Service (CLNS)
  clock        Display system time and date
  crossbars    Display crossbar status
  . . .
  tunnels      Services Information
  users        Display information about terminal lines
  version      Display version info
  virtual-routers Virtual Router information
  virtual-servers Virtual-servers
  vlan         Display virtual LAN information
  vlinks       Virtual links used by L2-ISIS protocol. One per peer
cfmodl#
```

```
cfmodl> show clock ?
| Output modifiers
> Output redirection
<cr>
cfmodl>
```

```
cfmodl> show clock
Fri May 6 14:24:00 EDT 2016
cfmodl>
```

Output Modifiers

This guide refers to some of the output modifiers available in the CLI. For example:

```
cfmodl# show clock ? | Output modifiers > Output redirection <cr>
```

```
cfmodl# show clock | ?
begin      Begin with the line that matches
exclude    Exclude lines that match
include    Include lines that match
redirect   Redirect output
repeat     Repeat command
```

Repeat a Show Command

You can use the repeat output modifier with any show command and its associated arguments to have this command repeatedly executed with a delay between executions. You specify the delay in seconds or retain the default value of 2 seconds.

The show command continues to be run over and over until interrupted with **CTRL-C**.

For example:

```
cfmodl# show interface mgmt | repeat
Repeat every 2s (CTRL-C to stop): show interface mgmt

Interface: mgmt   ifIndex: 3
Ethernet Hardware Address: e039.d700.957f
Admin: up        Link: up          Oper: up          STP: blocked
Duplex: full     MTU: 1500        Bandwidth: 1g
Inet: 172.17.225.252/16          Broadcast: 172.17.255.255

Repeat every 2s (CTRL-C to stop): show interface mgmt

Interface: mgmt   ifIndex: 3
Ethernet Hardware Address: e039.d700.957f
Admin: up        Link: up          Oper: up          STP: blocked
Duplex: full     MTU: 1500        Bandwidth: 1g
Inet: 172.17.225.252/16          Broadcast: 172.17.255.255

. . .

Repeat every 2s (CTRL-C to stop): show interface mgmt

Interface: mgmt   ifIndex: 3
Ethernet Hardware Address: e039.d700.957f
Admin: up        Link: up          Oper: up          STP: blocked
Duplex: full     MTU: 1500        Bandwidth: 1g
Inet: 172.17.225.252/16          Broadcast: 172.17.255.255
<CTRL-C>
cfmodl#
```

10 CLI Command Reference – Exec mode

The EXEC (Executive) mode includes all of the following commands:

The EXEC mode prompt is:

```
CFmodNum>
```

clear access-list

Clear access list statistics.

Syntax

```
clear access-list  
clear access-list WORD
```

where:

```
WORD          ZebOS access-list name
```

clear clns

Clear Connectionless-Mode Network Service (CLNS) information.

Syntax

```
clear clns is-neighbors  
clear clns neighbors
```

where:

```
is-neighbors    IS neighbor adjacencies  
neighbors       CLNS neighbor adjacencies
```

clear counters

Clear interface counters.

Syntax

```
clear counters IFNAME  
clear counters all
```

where:

```
IFNAME         Interface name  
all            All interfaces
```

clear fastpath statistics

Clear Fastpath information.

Syntax

```
clear fastpath statistics
```

clear ip

Clear the following IP database information:

- Fastpath information
- Internet Group Management Protocol (IGMP) group or interface
- Intermediate System - Intermediate System (IS-IS) route
- Multicast route table entries
- Network Address Translation (NAT)
- Protocol Independent Multicast (PIM)

Syntax

```
clear ip fastpath statistics
clear ip igmp
clear ip igmp group *
clear ip igmp group A.B.C.D
clear ip igmp group A.B.C.D IFNAME
clear ip igmp interface IFNAME
clear ip igmp vrf NAME
clear ip isis WORD
clear ip isis route all
clear ip isis route redistribution
clear ip mroute *
clear ip mroute * pim
clear ip mroute * pim dense-mode
clear ip mroute * pim sparse-mode
clear ip mroute A.B.C.D
clear ip mroute A.B.C.D pim sparse-mode
clear ip mroute A.B.C.D A.B.C.D
clear ip mroute A.B.C.D A.B.C.D pim (dense-mode|sparse-mode)
clear ip mroute statistics *
clear ip mroute statistics A.B.C.D
clear ip mroute statistics A.B.C.D A.B.C.D
clear ip nat statistics
clear ip pim sparse-mode bsr rp-set *
clear ip pim vrf NAME sparse-mode bsr rp-set *
```

where:

| | |
|---------------------------------------|--------------------------------------|
| fastpath statistics | Fastpath information |
| igmp | IGMP information |
| igmp group * | Delete all groups |
| igmp group A.B.C.D | Multicast group Address |
| igmp group A.B.C.D IFNAME | Interface name |
| igmp interface IFNAME | Interface name |
| igmp vrf NAME | VPN routing/forwarding instance name |
| isis WORD | ISO routing area tag |
| isis route all | Routing table |
| isis route redistribution | ISIS IP local redistribution routes |
| mroute * | Delete all multicast routes |
| mroute * pim | Protocol Independent Multicast (PIM) |
| mroute * pim dense-mode | Dense Mode (PIM-DM) |
| mroute * pim sparse-mode | Sparse Mode (PIM-SM) |
| mroute A.B.C.D | Group IP address |
| mroute A.B.C.D pim sparse-mode | Sparse Mode (PIM-SM) |
| mroute A.B.C.D A.B.C.D | Source IP address |
| mroute A.B.C.D A.B.C.D pim | Protocol Independent Multicast (PIM) |
| mroute statistics * | All multicast route entry statistics |
| mroute statistics A.B.C.D | Group IP address |
| mroute statistics A.B.C.D A.B.C.D | Source IP address |
| nat statistics | NAT Statistics |
| pim sparse-mode bsr rp-set * | All RP sets |
| pim vrf NAME sparse-mode bsr rp-set * | Clear all RP sets |

clear ipv6

Clear the following Internet Protocol version 6 (IPv6) database information:

- Access lists
- Fastpath statistics
- Intermediate System - Intermediate System (IS-IS) route

Syntax

```
clear ipv6 access-list
clear ipv6 access-list WORD
clear ipv6 fastpath statistics
clear ipv6 isis WORD
clear ipv6 isis route all
clear ipv6 isis route redistribution
```

where:

| | |
|------------------------|-------------------------------------|
| access-list | Clear IPv6 access lists stats |
| WORD | IPv6 ZebOS access-list name |
| fastpath statistics | Fastpath information |
| isis WORD | IPv6 ZebOS access-list name |
| isis route all | All the IS-IS routing table |
| isis route redirection | ISIS IP local redistribution routes |

clear isis

Clear the following Intermediate System - Intermediate System (IS-IS) database information:

- ISO routing area tag
- IS-IS isisSystemCounterEntry MIBs
- Interface information
- Reset ISIS process

Syntax

```
clear isis WORD
clear isis counter
clear isis interface counter
clear isis interface counter IFNAME
clear isis process
```

where:

| | |
|-------------------|-----------------------------------|
| WORD | ISO routing area tag |
| Counter | IS-IS isisSystemCounterEntry MIBs |
| interface counter | Interface counters |
| IFNAME | Interface name |
| Process | Reset ISIS process |

clear l2-isis

Clear the following L2 Intermediate System - Intermediate System (IS-IS) database information:

- L2 IS-IS isisSystemCounterEntry MIBs
- Interface information
- L2 IS neighbor adjacency
- L2 IS-IS neighbor adjacencies
- Reset ISIS process
- Routing table

Syntax

```
clear l2-isis counter
clear l2-isis interface counter
clear l2-isis interface counter IFNAME
clear l2-isis neighbor System-ID
clear l2-isis neighbors
clear l2-isis process
clear l2-isis route
```

where:

| | |
|--------------------|--------------------------------------|
| counter | L2 IS-IS isisSystemCounterEntry MIBs |
| interface counter | Interface counter |
| IFNAME | Interface name |
| neighbor System-ID | XXXX.XXXX.XXXX Neighbor system id |
| neighbors | L2 IS-IS neighbor adjacencies |
| process | Reset ISIS process |
| route | Routing Table |

clear mac sw-table

Clear MAC address database.

Syntax

```
clear mac sw-table
clear mac sw-table mac MAC
clear mac sw-table vlan-ids VLANS
```

debug bgp

Enable Border Gateway Protocol (BGP) troubleshooting functions. Use this command without any parameters to turn on normal BGP debug information.

Use the `no` parameter with this command to disable this function.

Syntax

```
debug bgp (all|)  
debug bgp dampening  
debug bgp events  
debug bgp evpn  
debug bgp filters  
debug bgp fsm  
debug bgp keepalives  
debug bgp nht  
debug bgp nsm  
debug bgp updates  
debug bgp updates (in|out)
```

where:

| | |
|------------|--------------------------|
| all | all debugging |
| dampening | BGP Dampening |
| events | BGP events |
| filters | BGP filters |
| fsm | BGP Finite State Machine |
| keepalives | BGP keepalives |
| nht | NHT message |
| nsm | NSM message |
| updates | BGP updates |

debug ip

Enable IP debugging.

| Syntax | Description |
|---|--|
| <pre>debug ip igmp all debug ip igmp decode debug ip igmp encode debug ip igmp events debug ip igmp fsm debug ip igmp tib debug ip igmp vrf</pre> | <p>Enable Internet Group Management Protocol (IGMP) debugging.</p> |
| <pre>debug ip mrib (all event vif mrt stats fib-msg register- msg nsm-msg mrib-msg mtrace mtrace- detail vrf)</pre> | <p>Enable Multicast Routing Information Base (MRIB) debugging.</p> |
| <pre>debug ip pim all debug ip pim events debug ip pim mfc debug ip pim mib debug ip pim mtrace debug ip pim nexthop debug ip pim nsm debug ip pim packet debug ip pim packet in debug ip pim packet out debug ip pim state debug ip pim timer debug ip pim timer assert debug ip pim timer assert at debug ip pim timer bsr debug ip pim timer bsr bst debug ip pim timer bsr crp debug ip pim timer hello debug ip pim timer hello ht debug ip pim timer hello nlt debug ip pim timer hello tht debug ip pim timer joinprune debug ip pim timer joinprune et debug ip pim timer joinprune jt debug ip pim timer joinprune kat debug ip pim timer joinprune ot debug ip pim timer joinprune ppt debug ip pim timer register debug ip pim timer register rst debug ip pim vrf</pre> | <p>Enable Protocol Independent Multicast (PIM) debugging.</p> |
| <pre>debug ip routing (add-route delete- route mod-route)</pre> | <p>Enable debugging for routing events.</p> |

debug ipv6 routing

Manage ipv6 debugging.

Syntax

```
debug ipv6 routing
debug ipv6 routing add-route
debug ipv6 routing delete-route
debug ipv6 routing mod-route
```

where:

| | |
|--------------|---------------------|
| add-route | Add route events |
| delete-route | Delete route events |
| mod-route | Modify route events |

debug isis

Manage Intermediate System - Intermediate System (IS-IS) debugging.

Syntax

```
debug isis
debug isis all
debug isis authentication
debug isis checksum
debug isis events
debug isis hello
debug isis hello System-ID
debug isis hello interface IFNAME
debug isis ifsm
debug isis local-updated
debug isis lsp
debug isis nfsm
debug isis pdu
debug isis protocol-errors
debug isis spf
```

where:

| | |
|-----------------|--------------------------------------|
| all | Enable all debugging |
| authentication | IS-IS authentication |
| checksum | IS-IS check-sum |
| events | IS-IS events |
| hello | IS-IS Hello debug |
| hello System-ID | IS-IS system ID |
| hello interface | IS-IS set interface name |
| ifsm | IS-IS Interface Finite State Machine |
| local-updates | IS-IS local updates |
| lsp | IS-IS Link State PDU |
| nfsm | IS-IS Neighbor Finite State Machine |
| pdu | IS-IS Protocol Data Unit |
| protocol-errors | IS-IS Protocol Errors |
| spf | IS-IS SPF calculation |

debug l2-isis

Manage L2 Intermediate System - Intermediate System (IS-IS) debugging.

Syntax

```
debug l2-isis
debug l2-isis all
debug l2-isis authentication
debug l2-isis checksum
debug l2-isis events
debug l2-isis hello
debug l2-isis hello System-ID
debug l2-isis hello interface IFNAME
debug l2-isis ifsm
debug l2-isis local-updated
debug l2-isis lsp
debug l2-isis n fsm
debug l2-isis pdu
debug l2-isis protocol-errors
debug l2-isis spf
```

where:

| | |
|-----------------|---|
| all | Enable all debugging |
| authentication | L2 IS-IS authentication |
| checksum | L2 IS-IS check-sum |
| events | L2 IS-IS events |
| hello | L2 IS-IS Hello debug |
| hello System-ID | L2 IS-IS system ID |
| hello interface | L2 IS-IS set interface name |
| ifsm | L2 IS-IS Interface Finite State Machine |
| local-updates | L2 IS-IS local updates |
| lsp | L2 IS-IS Link State PDU |
| n fsm | L2 IS-IS Neighbor Finite State Machine |
| pdu | L2 IS-IS Protocol Data Unit |
| protocol-errors | L2 IS-IS Protocol Errors |
| spf | L2 IS-IS SPF calculation |

debug mrd

Enable Multicast Route Daemon (MRD) debugging.

Syntax

```
debug mrd
debug mrd all
debug mrd event
debug mrd event cnode
debug mrd event mdrv
debug mrd event mrrib
debug mrd event nsm
debug mrd event psd
debug mrd fib
debug mrd fsm
debug mrd vif
```

where:

| | |
|-------|--------------------------|
| all | Enable all MRD debugging |
| event | Events |
| cnode | Cnode events |
| mdrv | mcast driver events |
| mrrib | MRIB events |
| nsm | NSM events |
| psd | PSD events |
| fib | FIB logs |
| fsm | FSM logs |
| vif | Interface logs |

debug nsm

Enable Network Service Module (NSM) debugging. Enable and specify debug options for NSM events, kernel, and receive and send packets. Use the no parameter with these commands to disable NSM debugging.

Syntax

```
Debug nsm
debug nsm all
debug nsm events
debug nsm ha
debug nsm ha all
debug nsm kernel
debug nsm packet
debug nsm packet detail
debug nsm packet recv
debug nsm packet send
```

where:

```
all          Enable all debugging
events       NSM events
ha           NSM High Availability
kernel       NSM kernel
packet       NSM packets
  detail     Detailed information display
  recv       NSM receive packets
  send       NSM send packets
```

debug ospf

Enable Open Shortest Path First (OSPF) debugging.

Syntax

```
debug ospf
debug ospf all
debug ospf database-timer rate-limit
debug ospf events ({abr|asbr|lsa|nssa|os|router|vlink}||)
debug ospf ifsm ({events|status|timers}||)
debug ospf lsa ({flooding|generate|install|maxage|refresh}||)
debug ospf nfsm ({events|status|timers}||)
debug ospf nsm ({interface|redistribute}||)
debug ospf packet ({hello|dd|ls-request|ls-update|ls-ack|send|recv|detail}||)
debug ospf route ({ase|ia|install|spf}||)
```

where:

```
all          Enable all debugging
database-timer OSPF Database Timers
events       OSPF events information
ifsm         OSPF Interface State Machine
lsa          OSPF Link State Advertisement
nfsm         OSPF Neighbor State Machine
nsm          OSPF NSM information
packet       OSPF packets
route        OSPF route information
```



debug pim

Enable Protocol Independent Multicast (PIM) debugging.

Syntax

```
debug pim all
debug pim vrf
```

where:

```
all          Enable all PIM debugging
vrf         VPN routing/forward instance
```

debug pip

Enable Plexxi Imi Proxy (PIP) Daemon debugging.

Syntax

```
Debug pip
debug pip all
debug pip events
debug pip cfg-cmd
```

Where:

```
all          Enable all PIP debugging
cfg-cmd     Config Cmd Log
events      PIP event Log
```

debug prd

Enable Plexxi Route Daemon (PRD) debugging.

Syntax

```
debug prd
debug prd all
debug prd event
debug prd event cmd
debug prd event nsm
debug prd event psd
debug prd fib
debug prd fib intf
debug prd fib nat
debug prd fib vr
debug prd host
debug prd host dynamic
debug prd host intfaddr
debug prd host nexthop
debug prd intf
debug prd intf fib
debug prd intf nat
debug prd intf vr
debug prd nat
debug prd nat fib
debug prd nat vr
debug prd pdu
debug prd pdu arp-bus
debug prd pdu cmd-vr
debug prd pdu ndp-bus
debug prd pdu rcv-fp
debug prd pdu rcv-sp
debug prd pdu xmt-fp
debug prd pdu xmt-sp
debug prd vr
debug prd vr fib
debug prd vr intf
debug prd vr nat
```

Where:

| | |
|----------|--------------------------|
| all | Enable all PRD debugging |
| event | PRD Events to and from |
| cmd | PST command and events |
| nsm | NSM events |
| psd | PSD events |
| fib | Vlan Intf logs |
| intf | Vlan Intf logs |
| nat | NAT logs |
| vr | Virtual router logs |
| host | PRD Host Logging |
| dynamic | Dyn NBR logs |
| intfaddr | Intf addr logs |
| nexthop | Nexthop logs |
| intf | Vlan Intf logs |
| fib | FIB logs |
| nat | NAT logs |
| vr | Virtual router logs |
| nat | NAT logs |
| fib | FIB logs |
| vr | Virtual router logs |
| pdu | PDU Logging |
| vr | Virtual Router logs |

disable

Exit the privileged exec (PRIV-EXEC) mode.

Syntax

```
disable
```

enable

Turn on the privileged exec (PRIV-EXEC) mode.

Syntax

```
enable
```

exit | quit

Exit the current mode down to the next lower mode.

Syntax

```
exit
```

help

Display general help info.

Syntax

```
help
```

logout

Exit the fabric module CLI.

Syntax

```
logout
```

no debug

Disable debugging for all or specific features.

Syntax

```
no debug all  
no debug bgp  
no debug ip  
no debug ipv6  
no debug isis  
no debug l2-isis  
no debug mrd  
no debug nsm  
no debug ospf  
no debug pim  
no debug pip  
no debug prd  
no debug vrf
```

ping

Send an ICMP echo to the host or IP address specified by WORD. With no arguments, the command is interactive.

Syntax

```
ping
Ping WORD
ping ip WORD
ping ipv6 WORD
ping ipv6 WORD IFNAME
ping vr0 WORD
```

where:

| | |
|--------|--------------------------------------|
| WORD | Ping destination address or hostname |
| IFNAME | Interface name |
| ip | IP echo |
| ipv6 | IPv6 echo |
| vr0 | Ping from vr0 namespace |

ping6

Send echo messages.

Syntax

```
ping6 WORD
ping6 vr0 WORD
ping6 vr0 WORD vrf NAME
```

where:

| | |
|------|--------------------------------------|
| WORD | Ping destination address or hostname |
| vr0 | Ping from vr0 namespace |
| WORD | Ping destination address or hostname |
| vrf | VPN routing/forwarding instance |
| NAME | VPN routing/forwarding instance |

quit

Exit current mode and down to previous mode.

Syntax

```
quit
```

show access-list

List IP access lists.

Syntax

```
show access-list
```

show bgp

Display Border Gateway Protocol (BGP) network information.

| Syntax | Description |
|--|---|
| <code>show bgp X:X::X:X</code> | IPv6 prefix <network>, e.g. 2003:: |
| <code>show bgp X:X::X:X/M</code> | IPv6 prefix <network>/<length>, e.g., 2003::/16 |
| <code>show bgp community</code> | Display routes matching the communities |
| <code>show bgp community-list</code> | Display routes matching the community-list. |
| <code>Show bgp dampening</code> | Display detailed information about dampening. |
| <code>Show bgp evpn</code> | Address family modifier. |
| <code>show bgp filter-list</code> | Display routes conforming to the filter-list. |
| <code>show bgp inconsistent-as</code> | Display routes with inconsistent AS Paths. |
| <code>show bgp ipv4</code> | Internet Protocol (IP). |
| <code>show bgp ipv6</code> | Internet Protocol version 6 (IPv6). |
| <code>show bgp neighbors</code> | Detailed information on TCP and BGP neighbor connections. |
| <code>show bgp nexthop-tracking</code> | Border Gateway Protocol (BGP) |
| <code>show bgp nexthop-tree-details</code> | Border Gateway Protocol (BGP) |
| <code>show bgp paths</code> | Path information. |
| <code>show bgp prefix-list</code> | Display routes matching the prefix-list. |
| <code>show bgp quote-regexp</code> | Display routes matching the AS path "regular expression". |
| <code>show bgp regexp</code> | Display routes matching the AS path regular expression. |
| <code>show bgp route-map</code> | Display routes matching the route-map. |
| <code>show bgp summary</code> | Summary of BGP neighbor status. |

show boot

Show information about what is installed in each disk partition, which partition is currently running, and which is alternate.

Syntax

`show boot`

show cli

Display a tree of CLI commands available in the current mode. Output includes all arguments.

| Syntax | Action |
|--------------------------------------|---|
| show cli | Display a tree of all CLI commands in the current mode. |
| show cli memory (detail extensive) | |

show clns

Display Connectionless-Mode Network Service (CLNS).

Syntax

```
show clns WORD
show clns is-neighbors
show clns is-neighbors IFNAME
show clns is-neighbors detail
show clns neighbors
show clns neighbors IFNAME
show clns neighbors detail
show clns protocol
show clns protocol WORD
```

where:

| | |
|--------------|---|
| WORD | Router are tag |
| is-neighbors | IS neighbor adjacencies |
| IFNAME | Interface name |
| detail | Show detailed information |
| neighbors | CLNS neighbor |
| IFNAME | Interface name |
| detail | Show detailed information |
| protocol | CLSN routing protocol process information |
| WORD | Routing area tag |

show clock

Display system time and date.

Syntax

```
show clock
```

show crossbars

Display crossbar status.

Syntax

```
show crossbars
```

show debugging

Debugging functions (see also 'undebug').

Syntax:

```
show debugging bgp
show debugging ip igmp
show debugging ip mrib
show debugging ip pim
show debugging isis
show debugging l2-isis
show debugging mrd
show debugging nsm
show debugging ospf
show debugging pim
show debugging pip
show debugging prd
```

where

```
bgp      Border Gateway Protocol (BGP)
ip igmp  Internet Group Management Protocol (IGMP)
ip mrip  Multicast Routing Information Base (MRIB)
ip pim   Protocol Independent Multicast (PIM)
mrd      Plexxi Multicast Route Daemon (MRD)
nsm      Display current Network Service Module (NSM) debug setting.
ospf     Open Shortest Path First (OSPF)
pim      Protocol Independent Multicast (PIM)
pip      Plexxi Imi Proxy Daemon (PIP)
prd      Plexxi Route Daemon (PRD)
```

show fastpath statistics

Display Fastpath information.

Syntax:

```
show fastpath statistics
show fastpath statistics active
```

where:

```
active    Active counters
```

show flow

Shows fabric module flows by various types and filters.

Note: This command is not supported.

Syntax

```
show flow <0-4294967295>
show flow dashboard
show flow details
show flow lag
show flow outputter
show flow policer
show flow port
show flow redirector
show flow statistics
show flow summary
shiw flow vlan
```

where:

| | |
|----------------|------------------------------|
| <0-4294967295> | Flow identifier |
| dashboard | Shows Available Tcam entries |
| detail | Flow details |
| lag | Show flow for a LAG |
| outputter | Outputter configuration |
| policer | Policer configuration |
| port | Show flow for a Port |
| redirector | Redirector configuration |
| statistics | Flow statistics |
| summary | Summary view of all flows |
| vlan | Show flow for a VLAN |

show hardware

Display general info about the hardware. Optionally, more detailed system hardware info, specific status information for fans, power supplies, and temperature sensors.

Syntax

```
show hardware
show hardware detail
show hardware fans
show hardware power
show hardware temp
```

where:

| | |
|--------|-------------------------------|
| detail | Detailed system hardware data |
| fans | Fan module info |
| power | Power supply info |
| temp | Temperature readings |

show history

Display the session command history.

Syntax

```
show history
```

show hold-policy

Display port holddown policy.

Syntax

```
show hold-policy
```

show hosts

Display domain and IP hostname lookup settings.

Syntax

```
show hosts
```

show install

Display partition install and boot setup.

Syntax

```
show install
```

show interface

Display interface information. If IFNAME is not given, all interfaces are listed. With 'statistics', normal counters are shown. With 'statistics errors', error counters are shown.

Syntax

```
show interface
show interface IFNAME
show interface statistics
show interface statistics errors
show interface summary
```

where:

| | |
|------------|--|
| IFNAME | Interface name |
| statistics | Statistical counters |
| errors | Error counters |
| summary | Summary information for all interfaces |

show ip access-list

Display IP access lists.

Syntax

```
show ip access-list
show ip access-list <1-99>
show ip access-list <100-199>
show ip access-list <1300-1999>
show ip access-list WORD
```

where:

| | |
|-------------|---------------------------------------|
| <1-99> | Standard access list |
| <100-199> | Extended access list |
| <1300-1999> | Standard access list (expanded range) |
| <2000-2699> | Extended access list (expanded range) |
| WORD | ZebOS access-list name |

show ip arp

Display the Address Resolution Protocol (ARP) cache.

Syntax

```
show ip arp
show ip arp detail
show ip arp fastpath
show ip arp macbind
show ip arp proactive
show ip arp storms
show ip arp vrf
```

where

| | |
|-----------|--|
| detail | Detailed information |
| fastpath | Fastpath information |
| macbind | Macbing information |
| proactive | Proactive ARP information |
| storms | ARP storm information |
| vrf | Routes from a VPN Routing/Forward instance |

show ip as-path-access-list

Display AS path access lists.

Syntax

```
show ip as-path-access-list
show ip as-path-access-list WORD
```

where

| | |
|------|--------------------------|
| list | AS path access lists |
| WORD | AS path access list name |

show ip bgp

Display Border Gateway Protocol (BGP) information.

Syntax

```
show ip bgp
show ip bgp A.B.C.D
show ip bgp A.B.C.D/M
show ip bgp attribute-info
show ip bgp cidr-only
show ip bgp community
show ip bgp community-info
show ip bgp community-list
show ip bgp dampening
show ip bgp filter-list
show ip bgp inconsistent-as
show ip bgp ipv4
show ip bgp neighbors
show ip bgp paths
show ip bgp prefix-list
show ip bgp quote-regexp
show ip bgp regexp
show ip bgp route-map
show ip bgp scan
show ip bgp summary
show ip bgp view
show ip bgp vpnv4
show ip bgp vpnv6
```

where

| | |
|-----------------|--|
| A.B.C.D | IP prefix <network>, e.g., 10.0.0.0 |
| A.B.C.D | IP prefix <network>/<length>, e.g., 10.0.0.0/8 |
| Attribute-info | List all bgp attribute information |
| cidr-only | Display only routes with non-natural netmasks |
| community | Display routes matching the communities |
| community-info | List all bgp community information |
| community list | Display routes matching the community-list |
| dampening | Display detailed information about dampening |
| filter-list | Display routes conforming to the filter-list |
| inconsistent-as | Display routes with inconsistent AS Paths |
| ipv4 | Address family |
| neighbors | Detailed information on TCP and BGP neighbor connections |
| paths | Path information |
| prefix-list | Display routes matching the prefix-list |
| quote-regexp | Display routes matching the AS path "regular expression" |
| regexp | Display routes matching the AS path regular expression |
| route-map | Display routes matching the route-map |
| scan | BGP scan status |
| summary | Summary of BGP neighbor status |
| view | BGP view |
| vpnv4 | Display VPNv4 NLRI specific information |
| pnv6 | Display VPNv6 NLRI specific information |

show ip community-list

Display community list information.

Syntax

```
show ip community list
show ip community list <1-199>
show ip community list WORD
```

where

| | |
|---------|-----------------------|
| <1-199> | Community list number |
| WORD | Community list name |

show ip dhcp-relay

Display learned DHCP servers being relayed.

Note: This command is not supported.

Syntax

```
show ip dhcp relay
```

show ip domain-list

Display list of DNS search domains.

Syntax

```
show ip domain-list
```

show ip domain-name

Display default domain assigned.

Syntax

```
show ip domain-name
```

show ip extcommunity-list

Display extended-community list.

Syntax

```
show ip extcommunity-list  
show ip extcommunity list <1-199>  
show ip extcommunity list WORD
```

where

```
<1-199>      Community list number  
WORD        Community list name
```

show ip fastpath

Display IP fast path statistics.

Syntax

```
show ip fastpath fnh  
show ip fastpath nht  
show ip fastpath statistics  
show ip fastpath statistics active  
show ip fastpath vrf
```

where:

```
fastpath fnh      Fastpath forward nexthop information  
fastpath nht      Fastpath nexthop tracking information  
fastpath statistics Fastpath statistics  
    active        Active counters  
vrf               Routes from a VPN Routing/Forwarding instance
```



show ip host

Display IP host information.

Syntax

```
show ip host
show ip host A.B.C.D
show ip host detail
show ip host extensive
show ip host vrf
```

where:

| | |
|-----------|---|
| A.B.C.D | Host address to display |
| Detail | Detailed information |
| Extensive | Extensive information |
| Vrf | Routes from a VPN Routing/Forwarding instance |

show ip icmp stats

Display ICMP statistics.

Syntax

```
show ip icmp stats
```

show ip igmp

Display Internet Group Management Protocol (IGMP) information.

Syntax

```
show ip igmp groups
show ip igmp interface
show ip igmp proxy
show ip igmp snooping
show ip igmp snooping fastpath
show ip igmp snooping groups
show ip igmp snooping mrouter
show ip igmp snooping vrf
show ip igmp ssm-map
show ip igmp vrf
```

where:

| | |
|-----------|------------------------------------|
| groups | Group membership information |
| interface | Interface information |
| proxy | Proxy information |
| ssm-map | Source-specific multicast mapping |
| snooping | Layer 2 snooping information |
| fastpath | Fastpath information |
| groups | Multicast groups |
| mrouter | Multicast router |
| vlan | Specific Virtual LAN |
| vrf | VPN routing/forwarding information |

show ip interface

Display IP interface status and configuration information.

Syntax

```
show ip interface
show ip interface IFNAME
show ip interface brief
show ip interface detail
show ip interface extensive
show ip interface hardware
show ip interface statistics
```

where:

| | |
|------------|--|
| IFNAME | Interface name |
| brief | Brief summary of IP status and configuration |
| detail | Detailed information |
| extensive | Extensive information |
| hardware | Hardware information |
| statistics | Statistics |

show ip isis

Display Intermediate System - Intermediate System (IS-IS) information.

Syntax

```
show ip isis WORD
show ip isis route
```

where:

| | |
|-------|------------------|
| WORD | Routing area tag |
| route | IP routing table |

show ip mroute

Display IP multicast routing table information.

Syntax

```
show ip mroute
show ip mroute A.B.C.D
show ip mroute count
show ip mroute dense
show ip mroute fastpath
show ip mroute sparse
show ip mroute summary
show ip mroute vrf
```

where:

| | |
|----------|---------------------------------|
| A.B.C.D | Source or group IP address |
| count | Route and packet count data |
| dense | Dense multicast routes |
| fastpath | Fastpath routes |
| sparse | Spare multicast routes |
| summary | Abbreviated multicast routes |
| vrf | VPN routing/forwarding instance |



show ip mvif

Display IP multicast interface information.

Syntax

```
show ip mvif
show ip mvif IFNAME
show ip mvif detail
show ip mvif extensive
show ip mvif hardware
show ip mvif vrf
```

where:

| | |
|-----------|---------------------------------|
| IFNAME | Interface name |
| detail | Detailed information |
| extensive | Extensive information |
| hardware | Hardware information |
| vrf | VPN routing/forwarding instance |

show ip name-server

Display configured DNS server IP addresses.

Syntax

```
show ip name server
```

show ip nat

Display Network Address Translation (NAT) information.

Syntax

```
show ip nat interface
show ip nat statistics
show ip nat translation
```

where:

| | |
|-------------|-----------------------|
| interface | Interface information |
| statistics | Global statistics |
| translation | Translation |

show ip ospf

Display Open Shortest Path First (OSPF) information.

Syntax

```
show ip ospf
show ip ospf <0-65535>
show ip ospf border-routers
show ip ospf database
show ip ospf interface
show ip ospf neighbor
show ip ospf opaque-area
show ip ospf opaque-as
show ip ospf opaque-link
show ip ospf route
show ip ospf router-channel
show ip ospf virtual-links
```

where:

| | |
|----------------|--|
| <0-65535> | Process ID number |
| border-routers | Border and boundary router information |
| database | Database summary |
| interface | Interface information |
| neighbor | Neighbor list |
| opaque-area | Link to Opaque-LSA |
| opaque-as | Link AS Opaque-LSA |
| opaque-link | Link local Opaque-LSA |
| route | OSPF routing table |
| router-channel | Router channel setting |
| virtual-links | Virtual link information |

show ip pim

Display Protocol Independent Multicast (PIM) information.

Syntax

```
show ip pim bsr-router
show ip pim interface
show ip pim local members
show ip pim mroute
show ip pim neighbor
show ip pim nexthop
show ip pim register
show ip pim rp
show ip pim rp-hash
show ip pim vrf
```

where:

| | |
|-------------------|---|
| pim bsr-router | Bootstrap router (v2) |
| pim interface | Interface information |
| pim local-members | Local membership information |
| pim mroute | Tree information base |
| pim neighbor | Neighbor information |
| pim nexthop | Register information |
| pim rp | Rendezvous Point (RP) information |
| pim rp-hash | RP to be chosen based on group selected |
| pim vrf | VPN routing/forwarding instance |

show ip protocols

Display IP routing protocol process parameters and statistics.

Syntax

```
show ip protocols
show ip protocols bgp
show ip protocols isis
show ip protocols ospf
```

where:

| | |
|------|--|
| bgp | Border Gateway Protocol (BGP) information |
| isis | Intermediate system - Intermediate system (ISIS) information |
| ospf | Open Shortest Path First (OSPF) information |
| vrf | VPN routing/forwarding instance |

show ip route

Display IP routing table information.

Syntax

```
show ip route
show ip route A.B.C.D
show ip route A.B.C.D/M
show ip route connected
show ip route database
show ip route ecmp
show ip route fastpath
show ip route kernel
show ip route ospf
show ip route registration
show ip route static
show ip route summary
show ip route vrf
```

where:

| | |
|--------------|--|
| A.B.C.D | Network in the IP routing table to display |
| A.B.C.D/M | IP prefix <network>/<length>, e.g., 10.0.0.0/8 |
| Connected | Connected information |
| database | IP routing table database |
| ecmp | ECMP information |
| fastpath | Fastpath information |
| kernel | Kernel information |
| ospf | Open Shortest Path First (OSPF) information |
| registration | IP routing table registrations |
| static | Static routes |
| summary | Summary of all routes |
| vrf | IP routing table registrations |

show ip rpf

Display RPF information for multicast source.

Syntax

```
show ip rpf A.B.C.D
show ip rpf vrf
```

where:

| | |
|---------|--|
| A.B.C.D | IP address of multicast source information |
| vrf | VPN routing/forwarding instance |

show ip vrf

Display VPN routing/forwarding instance information.

Syntax

```
show ip vrf
show ip WORD
show ip Fastpath
```

where:

| | |
|----------|--------------------------------------|
| WORD | VPN Routing/Forwarding instance name |
| Fastpath | Fastpath information |

show ipv6 access-list

Display IP access lists.

Syntax

```
show ipv6 access-list
show ipv6 access-list WORD
```

where:

| | |
|------|------------------------|
| WORD | ZebOS access-list name |
|------|------------------------|

show ipv6 enable

Display ipv6 support status (enabled or disabled).

Syntax

```
show ipv6 enable
```

show ipv6 fastpath

Display fastpath information.

Syntax

```
show ipv6 fastpath fnh
show ipv6 fastpath nht
show ipv6 fastpath statistics
show ipv6 fastpath statistics active
show ipv6 fastpath vrf
```

where:

| | |
|---------------------|---|
| fastpath fnh | Fastpath forward nexthop information |
| fastpath nht | Fastpath nexthop tracking information |
| fastpath statistics | Fastpath statistics |
| active | Active counters |
| vrf | Routes from a VPN Routing/Forwarding instance |



show ipv6 host

Display IPv6 host information.

Syntax

```
show ipv6 host
show ipv6 host detail
show ipv6 host extensive
show ipv6 host vrf
show ipv6 host X:X::X:X
show ipv6 host X:X::X:X detail
show ipv6 host X:X::X:X extensive
show ipv6 host X:X::X:X vrf
```

where:

| | |
|-----------|---|
| detail | Detailed information |
| extensive | Extensive information |
| vrf | Routes from a VPN Routing/Forwarding instance |
| X:X::X:X | Host address to display |

show ipv6 interface

Display IPv6 interface status and configuration information.

Syntax

```
show ipv6 interface
show ipv6 interface IFNAME
show ipv6 interface brief
show ipv6 interface detail
show ipv6 interface extensive
show ipv6 interface hardware
show ipv6 interface statistics
```

where:

| | |
|------------|--|
| IFNAME | Interface name |
| brief | Brief summary of IPv6 status and configuration |
| detail | Detailed information |
| extensive | Extensive information |
| hardware | Hardware information |
| statistics | Statistics |

show ipv6 isis

Display Intermediate System - Intermediate System (IS-IS) information.

Syntax

```
show ipv6 WORD route
show ipv6 WORD topology
show ipv6 WORD topology l1
show ipv6 WORD topology l2
show ipv6 WORD topology level-1
show ipv6 WORD topology level-2
show ipv6 route
show ipv6 topology l1
show ipv6 topology l2
show ipv6 topology level-1
show ipv6 topology level-2
```

where:

| | |
|----------|---|
| WORD | Routing area tag |
| Route | IS-IS IPv6 routing table |
| topology | IS-IS paths to Intermediate Systems |
| l1 | Path to all level-1 routers in the area |
| l2 | Path to all level-2 routers in the domain |
| level-1 | Path to all level-1 routers in the area |
| level-2 | Path to all level-2 routers in the domain |

show ipv6 neighbors

Display neighbor information.

Syntax

```
show ipv6 neighbors
show ipv6 neighbors detail
show ipv6 neighbors fastpath
show ipv6 neighbors fastpath detail
show ipv6 neighbors macbind
show ipv6 neighbors macbind detail
show ipv6 neighbors proactive
show ipv6 neighbors proactive detail
show ipv6 neighbors vrf
show ipv6 neighbors vrf WORD
show ipv6 neighbors vrf WORD detail
show ipv6 neighbors vrf WORD fastpath
show ipv6 neighbors vrf WORD fastpath detail
show ipv6 neighbors vrf WORD macbind
show ipv6 neighbors vrf WORD macbind detail
show ipv6 neighbors vrf WORD proactive
show ipv6 neighbors vrf WORD proactive detail
show ipv6 neighbors vrf detail
show ipv6 neighbors vrf fastpath
show ipv6 neighbors vrf fastpath detail
show ipv6 neighbors vrf macbind
show ipv6 neighbors vrf macbind detail
show ipv6 neighbors vrf proactive
show ipv6 neighbors vrf proactive detail
```

where:

| | |
|-----------|---|
| detail | Detailed information |
| fastpath | Fastpath information |
| macbind | Macbind information |
| proactive | Proactive NDP information |
| vrf | Routes from a VPN routing/forwarding instance |
| WORD | VPN routing/forwarding instance name |

show ipv6 protocols

Display Internet Protocol version 6 (IPv6) information.

Syntax

```
show ipv6 protocols
show ipv6 protocols isis
```

where:

isis Intermediate system - Intermediate system (ISIS) information

show ipv6 route

Display IPv6 routing table information.

Syntax

```
show ipv6 route
show ipv6 route X:X::X:X
show ipv6 route X:X::X:X ecmp
show ipv6 route X:X::X:X ecmp detail
show ipv6 route X:X::X:X fastpath
show ipv6 route X:X::X:X fastpath detail
show ipv6 route X:X::X:X vrf
show ipv6 route X:X::X:X vrf WORD
show ipv6 route X:X::X:X vrf WORD ecmp
show ipv6 route X:X::X:X vrf WORD ecmp detail
show ipv6 route X:X::X:X vrf WORD fastpath
show ipv6 route X:X::X:X vrf WORD fastpath detail
show ipv6 route X:X::X:X vrf ecmp
show ipv6 route X:X::X:X vrf ecmp detail
show ipv6 route X:X::X:X vrf fastpath
show ipv6 route X:X::X:X vrf fastpath detail
show ipv6 route X:X::X:X/M
show ipv6 route connected
show ipv6 route database
show ipv6 route database connected
show ipv6 route database kernel
show ipv6 route database ospf
show ipv6 route database static
show ipv6 route ecmp
show ipv6 route ecmp detail
show ipv6 route fastpath
show ipv6 route fastpath detail
show ipv6 route kernel
show ipv6 route ospf
show ipv6 route registration
show ipv6 route static
show ipv6 route summary
show ipv6 route vrf WORD
show ipv6 route vrf ecmp
show ipv6 route vrf ecmp detail
show ipv6 route vrf fastpath
show ipv6 route vrf fastpath detail
```

where:

| | |
|--------------|---|
| X:X::X:X | IPv6 address to display |
| X:X::X:X/M | IPv6 prefix |
| connected | Connected information |
| database | IP routing table database |
| ecmp | ECMP information |
| fastpath | Fastpath information |
| kernel | Kernel information |
| ospf | Open Shortest Path First (OSPF) information |
| registration | IP routing table registrations |
| static | Static routes |
| summary | Summary of all routes |
| vrf | IP routing table registrations |

| | |
|--------|--------------------------------------|
| WORD | VPN Routing/Forwarding instance name |
| Detail | Detailed information |

show isis

Display Plexxi L2 IS-IS Routing Daemon information.

Syntax

```
show isis WORD database
show isis WORD database WORD
show isis WORD database WORD detail
show isis WORD database WORD detail l1
show isis WORD database WORD detail l2
show isis WORD database WORD detail level-1
show isis WORD database WORD detail level-2
show isis WORD database WORD l1
show isis WORD database WORD l1 detail
show isis WORD database WORD l1 verbose
show isis WORD database WORD l2
show isis WORD database WORD l2 detail
show isis WORD database WORD l2 verbose
show isis WORD database WORD level-1
show isis WORD database WORD level-1 detail
show isis WORD database WORD level-1 verbose
show isis WORD database WORD level-2
show isis WORD database WORD level-2 detail
show isis WORD database WORD level-2 verbose
show isis WORD database WORD verbose
show isis WORD database WORD verbose l1
show isis WORD database WORD verbose l2
show isis WORD database WORD verbose level-1
show isis WORD database WORD verbose level-2
show isis WORD database detail
show isis WORD database detail WORD
show isis WORD database detail WORD l1
show isis WORD database detail WORD l2
show isis WORD database detail WORD level-1
show isis WORD database detail WORD level-2
show isis WORD database detail l1
show isis WORD database detail l1 WORD
show isis WORD database detail l2
show isis WORD database detail l2 WORD
show isis WORD database detail level-1
show isis WORD database detail level-1 WORD
show isis WORD database detail level-2
show isis WORD database detail level-2 WORD
show isis WORD database l1
show isis WORD database l1 WORD
show isis WORD database l1 detail
show isis WORD database l1 verbose
show isis WORD database l2
show isis WORD database l2 WORD
show isis WORD database l2 detail
show isis WORD database l2 verbose
show isis WORD database level-1
show isis WORD database level-1 WORD
show isis WORD database level-1 detail
show isis WORD database level-1 verbose
show isis WORD database level-2
show isis WORD database level-2 WORD
show isis WORD database level-2 detail
show isis WORD database level-2 verbose
show isis WORD database verbose
show isis WORD database verbose WORD
show isis WORD database verbose l1
show isis WORD database verbose l2
show isis WORD database verbose level-1
```



```
show isis WORD database verbose level-2
show isis WORD topology
show isis WORD topology l1
show isis WORD topology l2
show isis WORD topology level-1
show isis WORD topology level-2
show isis counter
show isis database
show isis database WORD
show isis database detail
show isis database l1
show isis database l2
show isis database level-1
show isis database level-2
show isis database verbose
show isis interface
show isis interface IFNAME
show isis interface counter
show topology
show topology l1
show topology l2
show topology level-1
show topology level-2
```

where:

| | |
|-----------|---|
| WORD | Routing area tag |
| counter | IS-IS isisSystemCounterEntry MIBs |
| database | IS-IS link state database |
| WORD | LSPID in the form of xxxx.xxxx.xxxx.xx-xx |
| detail | Detailed link state database information |
| l1 | IS-IS Level-1 routing link state database |
| l2 | IS-IS Level-2 routing link state database |
| level-1 | IS-IS Level-1 routing link state database |
| level-2 | IS-IS Level-2 routing link state database |
| verbose | Verbose database information |
| interface | Interface information |
| topology | IS-IS paths to Intermediate Systems |
| l1 | Path to all level-1 routers in the area |
| l2 | Path to all level-2 routers in the domain |
| level-1 | Path to all level-1 routers in the area |
| level-2 | Path to all level-2 routers in the domain |

show l2-isis

Display Plexxi L2 IS-IS routing daemon information.

Syntax

```
show l2-isis bum-graph
show l2-isis bum-graph mac
show l2-isis counter
show l2-isis database
show l2-isis database WORD
show l2-isis database WORD detail
show l2-isis database WORD detail l1
show l2-isis database WORD detail l2
show l2-isis database WORD detail level-1
show l2-isis database WORD detail level-2
show l2-isis database WORD l1
show l2-isis database WORD l1 mac
show l2-isis database WORD l2
show l2-isis database WORD l2 mac
show l2-isis database WORD level-1
show l2-isis database WORD level-1 mac
show l2-isis database WORD level-2
show l2-isis database WORD level-2 mac
show l2-isis database WORD mac
show l2-isis database WORD mac detail
show l2-isis database WORD mac verbose
show l2-isis database WORD verbose
show l2-isis database WORD verbose l1
show l2-isis database WORD verbose l2
show l2-isis database WORD verbose level-1
show l2-isis database WORD verbose level-2
show l2-isis database detail
show l2-isis database l1
show l2-isis database l1 WORD
show l2-isis database l1 detail
show l2-isis database l1 mac
show l2-isis database l1 verbose
show l2-isis database l1 verbose WORD
show l2-isis database l2
show l2-isis database l2 WORD
show l2-isis database l2 detail
show l2-isis database l2 mac
show l2-isis database l2 verbose
show l2-isis database l2 verbose WORD
show l2-isis database level-1
show l2-isis database level-1 WORD
show l2-isis database level-1 detail
show l2-isis database level-1 mac
show l2-isis database level-1 verbose
show l2-isis database level-1 verbose WORD
show l2-isis database level-2
show l2-isis database level-2 WORD
show l2-isis database level-2 detail
show l2-isis database level-2 mac
show l2-isis database level-2 verbose
show l2-isis database level-2 verbose WORD
show l2-isis database mac
show l2-isis database mac WORD
show l2-isis database mac detail
show l2-isis database mac l1
show l2-isis database mac l2
show l2-isis database mac level-1
show l2-isis database mac level 2
show l2-isis database mac verbose
show l2-isis database mac verbose WORD
show l2-isis database verbose
show l2-isis interface
```



```
show l2-isis interface IFNAME
show l2-isis interface counter
show l2-isis interface counter IFNAME
show l2-isis neighbors
show l2-isis neighbors IFNAME
show l2-isis neighbors IFNAME detail
show l2-isis neighbors detail
show l2-isis protocol
show l2-isis protocol json
show l2-isis route
show l2-isis route mac
show l2-isis summary
show l2-isis topology
show l2-isis topology l1
show l2-isis topology l2
show l2-isis topology level-1
show l2-isis topology level-2
show l2-isis topology mac
```

where:

| | |
|-----------|---|
| bum-graph | L2 IS-IS BUM graph |
| mac | Mac SystemID |
| counter | L2 IS-IS Interface Counters |
| database | L2 IS-IS link state database |
| word | LSPID in the form of xxxx.xxxx.xxxx.xx-xx |
| detail | Detailed link state database information |
| l1 | IS-IS Level-1 routing link state database |
| l2 | IS-IS Level-2 routing link state database |
| level-1 | IS-IS Level-1 routing link state database |
| level-2 | IS-IS Level-2 routing link state database |
| verbose | Verbose database information |
| protocol | L2 IS-IS routing protocol process information |
| json | JSON Formatted Output |
| route | L2 IS-IS routing table |
| summary | Summary counts at a glance |
| topology | L2 IS-IS paths to Intermediate Systems |
| l1 | Path to all level-1 routers in the area |
| l2 | Path to all level-2 routers in the domain |
| level-1 | Path to all level-1 routers in the area |
| level-2 | Path to all level-2 routers in the domain |
| mac | Mac SystemID |

show lacp

Display LACP status information for access ports (or one specified port).

Syntax

```
show lacp
show lacp IFNAME
show lacp lag
show lacp lag IFNAME
```

where:

| | |
|--------|------------------------------|
| IFNAME | Interface name |
| lag | Link aggregation information |

show lag

Display link aggregation information.

Syntax

```
show lag
show lag IFNAME
show lag IFNAME vlan
show lag lacp
show lag lacp IFNAME
```

where:

| | |
|--------|--|
| IFNAME | LAG interface name |
| vlan | Virtual LAN associations |
| Lacp | Link Aggregation Control Protocol (LACP) |

show list

Display a list of CLI commands available in the current mode.

Syntax

```
show list
```

show lldp

Displays the Link Layer Discovery Protocol (LLDP) global configuration.

Syntax

```
show lldp
show lldp detail
show lldp local-info
show lldp local-info IFNAME
show lldp local-info all
show lldp ports
```

where:

| | |
|------------|---|
| detail | Per Port LLDP status in addition to the basic information |
| local-info | Local system and port information |
| IFNAME | Specific interface |
| all | All interfaces |
| ports | Per port LLDP status only |

show log

Display system log entries.

Syntax

```
show log
show log c2
show log c2-messages
show log crash
show log erlang
show log events
show log l3
```

where:

| | |
|-------------|---------------------------|
| c2 | C2 Controller log entries |
| c2-messages | C2 log entries |
| crash | C2 crash log entries |
| erlang | C2 erlang log entries |
| events | Event log entries |
| l3 | L3 log entries |

show mrd router-channel

Display multicast route daemon information.

Syntax

```
show mrd router-channel
```

show mrib

Display MRIB information

Syntax

```
show mrib
```

show neighbor-discovery

Displays the Link Layer Discovery Protocol (LLDP) or the Cisco Discovery Protocol (CDP) remote/neighbor nodes information.

Syntax

```
show neighbor-discovery
show neighbor-discovery IFNAME
show neighbor-discovery all
show neighbor-discovery cdp
show neighbor-discovery lldp
show neighbor-discovery statistics
```

where:

| | |
|------------|--------------------|
| IFNAME | Specific IFNAME |
| all | All interfaces |
| cdp | CDP neighbors |
| lldp | LLDP neighbors |
| statistics | Statistics details |

show nsm

Display Network Service Module (NSM) information.

Syntax

```
show nsm
```

show ntp

Display Network Time Protocol (NTP) settings.

Syntax

```
show ntp associations  
show status
```

where:

```
associations    NTP associations  
status          NTP status
```

show post

Display power-on self-test results.

Syntax

```
show post
```

show privilege

Display current privilege level.

Syntax

```
show privilege
```

show qinq svlan

Display QinQ information for Service VLANs or for a specific Service VLAN ID.

Note: This command is not supported.

Syntax

```
show qinq svlan  
show qinq svlan SVLAN
```

where:

```
SVLAN          SVLAN ID
```

show qsfp

Display current Quad Small Form-factor Pluggable (QSFP) transceiver configuration settings such as redirect and control channel.

Syntax

```
show qsfp
```

show router-channel

Display Router Channel setting.

Syntax

```
show router-channel
```

show router-id

Display router identifier.

Syntax

```
show router-id
```



show services

Display services information.

Syntax

```
show services
```

show sflow

Display sFlow parameters and operational status.

Syntax

```
show sflow
show sflow interface
show sflow interface IFNAME
show sample-rate
show sample-rate IFNAME
```

where option is:

| | |
|-------------|-----------------------------|
| interface | Per port sflow statistics |
| IFNAME | Specific interface name |
| sample-rate | Per port sflow sample rates |

show system

Display system resource usage and time that the system has been running.

Syntax

```
show system resources
show system uptime
```

where option is:

| | |
|-----------|---------------------------------|
| resources | Usage of CPU, Memory, and so on |
| uptime | System uptime |

show tenants

Display tenant information.

Syntax

```
Show tenants
show tenants name STRING
show tenants name STRING statistics
show tenants statistics
```

where:

| | |
|-------------|-----------------------------|
| name STRING | Tenant name |
| statistics | Detailed tenant information |

show timezone

Display the system-configured timezone.

Syntax

```
show timezone
```

show topography

Display fabric status and neighbor information.

Syntax

```
show topography
```

show transceivers

Display transceiver status and information.

Syntax

```
show transceivers  
show transceivers NAME
```

where:

```
NAME                Transceiver name
```

show translation tvlan

Displays translated VLAN information.

Syntax

```
show translation tvlan  
show translation tvlan TVLAN
```

where:

```
TVLAN                TVLAN ID
```

show tunnels

Display services information.

Syntax

```
show tunnels  
show tunnels evpn          NOTE: This argument is not supported.  
show tunnels evpn min  
show tunnels evpn statistics  
show tunnels evpn vxlan  
show tunnels mim  
show tunnels statistics  
vxlan
```

where:

```
evpn                L2 VPN Tunnels Information   NOTE: This argument is not supported.  
mim                 All Mac-in-Mac tunnels  
statistics          Tunnel statistics  
vxlan               All VxLAN tunnels
```

show users

Display list of user sessions currently connected.

Syntax

```
show users
```

show version

Display version information.

Syntax

```
show version
show version detail
```

where:

```
detail    Additional version information
```

show virtual-routers

Display any virtual routers that exist and their status.

Syntax

```
show virtual routers
```

show virtual-severs

Display virtual-server information.

Syntax

```
show virtual servers
```

show vlan

Display VLAN (virtual LAN) and QinQ information.

Syntax

```
Show vlan
show vlan VLAN
show vlan group
show vlan translation NOTE: This argument is not supported.
show vlan tunnel
```

where:

```
VLAN          Specific VLAN ID.
group         VLAN and QinQ group settings.
translation   VLAN translation settings. NOTE: This argument is not supported.
tunnel       QinQ tunnels. NOTE: This argument is not supported.
```

If no argument is included, display information for all VLANs.

show vlinks

Display virtual links used by L2-ISIS protocol (one per peer).

Syntax

```
show vlan
```

ssh

Open an SSH connection.

Syntax

```
ssh WORD
```

where:

```
WORD      username@hostname or username@IPAddress
```

telnet

Open a TELNET connection. When a port is not specified, the default port 23 is used.

Syntax

```
telnet WORD  
telnet WORD PORT
```

where:

```
WORD      hostname or IP address  
PORT      TCP port number
```

terminal

Set the terminal line parameters. Use this session to monitor (display) debug output.

Syntax

```
terminal length <0-512>  
terminal no length  
terminal no length <0-512>  
terminal monitor  
terminal no monitor
```

where:

```
length          Set number of screen lines  
no length       Unset number of lines on a screen  
monitor         Start forwarding log output to this terminal  
no monitor      Stop forwarding log output to this terminal
```

trace-attachment

Trace a MAC attachment to its source and the path it takes.

Syntax

```
trace-attachment MAC VLAN  
trace-attachment hardware MAC VLAN  
trace-attachment info MAC VLAN  
trace-attachment switch SWITCH MAC VLAN
```

where:

```
MAC           MAC address  
VLAN          VLAN ID  
hardware      List of fabric modules where the MAC is installed in the hardware  
info          List the timestamp of latest DLF and SLF for the MAC locally  
switch        Execute from the context of another fabric module  
              SWITCH      Station MAC of the destination fabric module
```

traceroute

Trace route to destination. If no arguments are specified, the command is interactive.

Syntax

```
traceroute
traceroute WORD
traceroute ip WORD
traceroute ipv6 WORD
traceroute vr0 WORD
traceroute vr0 WORD vrf NAME
```

where:

| | |
|------|--------------------------------------|
| WORD | Destination address or hostname |
| ip | IP trace |
| ipv6 | IPv6 trace |
| vr0 | Trace route in vr0 namespace |
| WORD | Destination address or hostname |
| vrf | VPN Routing/Forwarding instance |
| NAME | VPN Routing/Forwarding instance name |

```
traceroute [ip] [hostname|IPAddress]
```

traceroute6

Trace route to destination.

Syntax

```
traceroute6 WORD
traceroute6 vr0 WORD
traceroute6 vr0 WORD vrf NAME
```

where:

| | |
|----------|---|
| WORD | Trace route to destination address or hostname |
| vr0 WORD | Trace route in vr0 namespace to destination address or hostname |
| vrf NAME | VPN routing/Forwarding instance name |

undebg

Disable debugging functions.

Syntax

```
undebg all
undebg all isis
undebg all isis all
undebg all isis authentication
undebg all isis checksum
undebg all isis events
undebg all isis hello
undebg all isis hello SYSTEM-ID
undebg all isis hello interface IFNAME
undebg all isis ifsm
undebg all isis local-updates
undebg all isis lsp
undebg all isis nfm
undebg all isis pdu
undebg all isis protocol-updates
undebg all isis spf
undebg all l2-isis
undebg all l2-isis all
undebg all l2-isis checksum
undebg all l2-isis events
undebg all l2-isis hello
undebg all l2-isis hello SYSTEM-ID
undebg all l2-isis hello interface IFNAME
undebg all l2-isis ifsm
```



```
undebg all l2-isis local-updates
undebg all l2-isis lsp
undebg all l2-isis nfsm
undebg all l2-isis pdu
undebg all l2-isis protocol-errors
undebg all l2-isis spf
undebg isis
undebg ospf
```

where:

```
all          Disable all debugging
isis        Intermediate System - Intermediate System (IS-IS)
  all       Turn off all Debugging
  authentication IS-IS Authentication
  checksum  IS-IS check-sum
  events    IS-IS events
  hello     IS-IS hello debug
            SYSTEM-ID XXXX.XXXX.XXXX
            Interface Unset Interface name
  ifsm      IS-IS Interface Finite State Machine
  local-updates IS-IS local updates
  lsp       IS-IS Link State PDU
  nfsm      IS-IS Neighbor Finite State Machine
  pdu       IS-IS PDU (Rcv & Xmit)
  protocol-errors IS-IS protocol errors
  spf       IS-IS SPF Events
l2-isis     Intermediate System - Intermediate System (IS-IS)
  all       Turn off all Debugging
  checksum  L2 IS-IS check-sum
  events    L2 IS-IS events
  hello     L2 IS-IS hello debug
            SYSTEM-ID XXXX.XXXX.XXXX
            Interface Unset Interface name
  ifsm      L2 IS-IS Interface Finite State Machine
  local-updates L2 IS-IS local updates
  lsp       L2 IS-IS Link State PDU
  nfsm      L2 IS-IS Neighbor Finite State Machine
  pdu       L2 IS-IS PDU (Rcv & Xmit)
  protocol-errors L2 IS-IS protocol errors
  spf       L2 IS-IS SPF Events
ospf        Disable Open Shortest Path First (OSPF) debugging
```




11 CLI Command Reference – PRIV-EXEC mode

The PRIV-EXEC (Privileged or Executive) mode includes all the commands available in EXEC mode plus the following commands:

The PRIV-EXEC mode prompt is:

```
cfmod1#
```

boot toggle

Toggle the active boot partition so the alternate partition runs on the next cold restart (`reload`).

Syntax

```
boot toggle
```

clear arp-cache

Remove all dynamic ARP entries.

Syntax

```
clear arp-cache
```

clear bgp

Remove Border Gateway Protocol (BGP) entries.

Syntax

```
clear bgp *
clear bgp <1-4294967295>
clear bgp <1-4294967295> in
clear bgp <1-4294967295> in prefix-filter
clear bgp <1-4294967295> out
clear bgp <1-4294967295> soft
clear bgp <1-4294967295> soft in
clear bgp <1-4294967295> soft out
clear bgp A.B.C.D
clear bgp A.B.C.D in
clear bgp A.B.C.D in prefix-filter
clear bgp A.B.C.D out
clear bgp A.B.C.D soft
clear bgp X:X::X:X
clear bgp X:X::X:X in
clear bgp X:X::X:X in prefix-filter
clear bgp X:X::X:X out
clear bgp X:X::X:X soft
clear bgp external
clear bgp external in
clear bgp external in prefix-filter
clear bgp external out
clear bgp external soft
clear bgp ipv4 multicast dampening
clear bgp ipv4 multicast dampening A.B.C.D
clear bgp ipv4 multicast dampening A.B.C.D/M
clear bgp ipv4 multicast flap-statistics
clear bgp ipv4 multicast flap-statistics A.B.C.D
clear bgp ipv4 multicast flap-statistics A.B.C.D/M
clear bgp ipv6
clear bgp ipv6 *
clear bgp ipv6 <1-4294967295>
clear bgp ipv6 A.B.C.D
clear bgp ipv6 X:X::X:X
clear bgp ipv6 external
clear bgp ipv6 peer-group WORD
clear bgp ipv6 peer-group WORD in
clear bgp ipv6 peer-group WORD in prefix-filter
clear bgp ipv6 peer-group WORD out
clear bgp ipv6 peer-group WORD soft
clear bgp ipv6 unicast dampening
clear bgp ipv6 unicast dampening X:X::X:X
clear bgp ipv6 unicast dampening X:X::X:X/M
clear bgp ipv6 unicast flap-statistics
clear bgp ipv6 unicast flap-statistics X:X::X:X
clear bgp ipv6 unicast flap-statistics X:X::X:X/M
clear bgp ipv6 unicast
clear bgp ipv6 unicast
clear bgp ipv6 unicast
clear bgp peer-group WORD
clear bgp peer-group WORD in
clear bgp peer-group WORD out
clear bgp peer-group WORD soft
clear bgp view WORD *
clear bgp view WORD * soft
clear bgp view WORD * soft in
clear bgp view WORD * soft out
```

where:

| | |
|----------------|--------------------------------|
| * | Clear all peers |
| <1-4294967295> | Clear peers with the AS number |
| in | Soft reconfig inbound update |

| | |
|-----------------|---|
| prefix-filter | Push out prefix-list ORF and do inbound soft reconfig |
| out | Soft reconfig outbound update |
| soft | Soft reconfig |
| A.B.C.D | BGP neighbor address to clear |
| X:X::X:X | BGP IPv6 neighbor to clear |
| external | Clear all external peers |
| ipv4 | Internet Protocol (IP) |
| dampening | Clear route flap dampening information |
| A.B.C.D | IP prefix <network>, e.g., 35.0.0.0 |
| A.B.C.D/M | IP prefix <network>/<length>, e.g., 35.0.0.0/8 |
| flap-statistics | Clear route flap statistics |
| A.B.C.D | IP prefix <network>, e.g., 35.0.0.0 |
| A.B.C.D/M | IP prefix <network>/<length>, e.g., 35.0.0.0/8 |
| ipv6 | Address family |
| peer-group WORD | Clear all members of specified peer-group |
| unicast | Address family modifier |
| dampening | Clear route flap dampening information |
| X:X::X:X | IPv6 prefix <network>, e.g., 2003:: |
| X:X::X:X/M | IPv6 prefix <network>/<length>, e.g., 2003::/16 |
| peer-group WORD | BGP peer-group name |
| view WORD | View name |

clear cores

Remove any existing core files on the system.

Syntax

```
clear cores
```

clear flow statistics

Remove fabric module flow statistics.

Note: This command is not supported.

Syntax

```
clear flow statistics
clear flow statistics <0-4294967295>
```

where:

```
<0-4294967295>          Flow identifier
```

clear hold

Disable administrative hold on one specific interface or all interfaces.

```
clear hold IFNAME
clear hold all
```

where:

```
IFNAME          Interface name
All             All interfaces
```

clear ip

Remove Internet Protocol (IP) information.

Syntax

```
clear ip bgp *
clear ip bgp * in
clear ip bgp * in prefix-filter
clear ip bgp * ipv4 multicast
clear ip bgp * ipv4 multicast in
clear ip bgp * ipv4 multicast in prefix-filter
clear ip bgp * ipv4 multicast out
```

```
clear ip bgp * ipv4 multicast soft
clear ip bgp * ipv4 multicast soft in
clear ip bgp * ipv4 multicast soft out
clear ip bgp * ipv4 unicast in
clear ip bgp * ipv4 unicast out
clear ip bgp * ipv4 unicast soft
clear ip bgp * ipv4 unicast soft in
clear ip bgp * ipv4 unicast soft out
clear ip bgp * ipv6 unicast in
clear ip bgp * ipv6 unicast out
clear ip bgp * ipv6 unicast soft
clear ip bgp * ipv6 unicast soft in
clear ip bgp * ipv6 unicast soft out
clear ip bgp * l2vpn evpn in
clear ip bgp * l2vpn evpn out
clear ip bgp * l2vpn evpn in soft in
clear ip bgp * l2vpn evpn in soft out
clear ip bgp * out
clear ip bgp * soft
clear ip bgp * soft in
clear ip bgp * soft out
clear ip bgp * vpnv4 unicast in
clear ip bgp * vpnv4 unicast out
clear ip bgp * vpnv4 unicast soft in
clear ip bgp * vpnv4 unicast soft out
clear ip bgp * vpnv6 unicast in
clear ip bgp * vpnv6 unicast out
clear ip bgp * vpnv6 unicast soft in
clear ip bgp * vpnv6 unicast soft out
clear ip bgp * vrf WORD
clear ip bgp * vrf WORD in
clear ip bgp * vrf WORD out
clear ip bgp * vrf WORD soft in
clear ip bgp * vrf WORD soft out

clear ip bgp <1-4294967295>
clear ip bgp <1-4294967295> in
clear ip bgp <1-4294967295> in prefix-filter
clear ip bgp <1-4294967295> ipv4 multicast in
clear ip bgp <1-4294967295> ipv4 multicast out
clear ip bgp <1-4294967295> ipv4 multicast soft
clear ip bgp <1-4294967295> ipv4 multicast soft in
clear ip bgp <1-4294967295> ipv4 multicast soft out
clear ip bgp <1-4294967295> ipv4 unicast dampening
clear ip bgp <1-4294967295> ipv4 unicast dampening A.B.C.D
clear ip bgp <1-4294967295> ipv4 unicast dampening A.B.C.D/M
clear ip bgp <1-4294967295> ipv4 unicast flap-statistics
clear ip bgp <1-4294967295> ipv4 unicast flap-statistics A.B.C.D
clear ip bgp <1-4294967295> ipv4 unicast flap-statistics A.B.C.D/M
clear ip bgp <1-4294967295> ipv6 unicast in
clear ip bgp <1-4294967295> ipv6 unicast out
clear ip bgp <1-4294967295> ipv6 unicast soft
clear ip bgp <1-4294967295> ipv6 unicast soft in
clear ip bgp <1-4294967295> ipv6 unicast soft out

clear ip bgp A.B.C.D
clear ip bgp A.B.C.D in
clear ip bgp A.B.C.D in prefix-filter
clear ip bgp A.B.C.D ipv4 multicast in
clear ip bgp A.B.C.D ipv4 multicast out
clear ip bgp A.B.C.D ipv4 multicast soft
clear ip bgp A.B.C.D ipv4 multicast soft in
clear ip bgp A.B.C.D ipv4 multicast soft out
clear ip bgp A.B.C.D l2vpn evpn in
clear ip bgp A.B.C.D l2vpn evpn out
clear ip bgp A.B.C.D l2vpn evpn soft
clear ip bgp A.B.C.D l2vpn evpn in soft in
clear ip bgp A.B.C.D l2vpn evpn in soft out
```

```
clear ip bgp A.B.C.D out
clear ip bgp A.B.C.D soft
clear ip bgp A.B.C.D soft in
clear ip bgp A.B.C.D soft out
clear ip bgp A.B.C.D vpn4 unicast in
clear ip bgp A.B.C.D vpn4 unicast out
clear ip bgp A.B.C.D vpn4 unicast soft
clear ip bgp A.B.C.D vpn4 unicast soft in
clear ip bgp A.B.C.D vpn4 unicast soft out
clear ip bgp A.B.C.D vrf WORD
clear ip bgp A.B.C.D vrf WORD in
clear ip bgp A.B.C.D vrf WORD out
clear ip bgp A.B.C.D vrf WORD soft
clear ip bgp A.B.C.D vrf WORD soft in
clear ip bgp A.B.C.D vrf WORD soft out

clear ip bgp X:X::X:X
clear ip bgp X:X::X:X in
clear ip bgp X:X::X:X out
clear ip bgp X:X::X:X soft
clear ip bgp X:X::X:X soft in
clear ip bgp X:X::X:X soft out
clear ip bgp X:X::X:X vpn6 unicast in
clear ip bgp X:X::X:X vpn6 unicast out
clear ip bgp X:X::X:X vpn6 unicast soft
clear ip bgp X:X::X:X vpn6 unicast soft in
clear ip bgp X:X::X:X vpn6 unicast soft out

clear ip bgp dampening
clear ip bgp dampening A.B.C.D
clear ip bgp dampening A.B.C D/M

clear ip bgp external
clear ip bgp external in
clear ip bgp external in prefix-filter
clear ip bgp external ipv4 multicast in
clear ip bgp external ipv4 multicast out
clear ip bgp external ipv4 multicast soft
clear ip bgp external ipv4 multicast soft in
clear ip bgp external ipv4 multicast soft out
clear ip bgp external ipv4 unicast in
clear ip bgp external ipv4 unicast out
clear ip bgp external ipv4 unicast soft
clear ip bgp external ipv4 unicast soft in
clear ip bgp external ipv4 unicast soft out
clear ip bgp external out
clear ip bgp external soft
clear ip bgp external soft in
clear ip bgp external soft out

clear ip bgp flap-statistics
clear ip bgp flap-statistics A.B.C.D
clear ip bgp flap-statistics A.B.C.D/M

clear ip bgp ipv4 multicast dampening
clear ip bgp ipv4 multicast dampening A.B.C.D
clear ip bgp ipv4 multicast dampening A.B.C.D/M
clear ip bgp ipv4 multicast flap-statistics
clear ip bgp ipv4 multicast flap-statistics A.B.C.D
clear ip bgp ipv4 multicast flap-statistics A.B.C.D/M
clear ip bgp ipv4 unicast dampening
clear ip bgp ipv4 unicast dampening A.B.C.D
clear ip bgp ipv4 unicast dampening A.B.C.D/M
clear ip bgp ipv4 unicast flap-statistics
clear ip bgp ipv4 unicast flap-statistics A.B.C.D
clear ip bgp ipv4 unicast flap-statistics A.B.C.D/M

clear ip bgp ipv6 unicast dampening
clear ip bgp ipv6 unicast dampening X:X::X:X
clear ip bgp ipv6 unicast dampening X:X::X:X/M
```

```
clear ip bgp ipv6 unicast flap-statistics
clear ip bgp ipv6 unicast flap-statistics X:X::X:X
clear ip bgp ipv6 unicast flap-statistics X:X::X:X/M

clear ip bgp peer-group WORD
clear ip bgp peer-group WORD in
clear ip bgp peer-group WORD in prefix-filter
clear ip bgp peer-group WORD ipv4 multicast
clear ip bgp peer-group WORD ipv4 multicast in
clear ip bgp peer-group WORD ipv4 multicast out
clear ip bgp peer-group WORD ipv4 multicast soft
clear ip bgp peer-group WORD ipv4 multicast soft in
clear ip bgp peer-group WORD ipv4 multicast soft out
clear ip bgp peer-group WORD ipv4 unicast soft
clear ip bgp peer-group WORD ipv4 unicast soft in
clear ip bgp peer-group WORD ipv4 unicast soft out
clear ip bgp peer-group WORD l2vpn evpn in
clear ip bgp peer-group WORD l2vpn evpn out
clear ip bgp peer-group WORD l2vpn evpn soft in
clear ip bgp peer-group WORD l2vpn evpn soft out
clear ip bgp peer-group WORD out
clear ip bgp peer-group WORD soft
clear ip bgp peer-group WORD soft in
clear ip bgp peer-group WORD soft out

clear ip bgp view WORD * in prefix-filter
clear ip bgp view WORD * ipv4 multicast in
clear ip bgp view WORD * ipv4 multicast soft
clear ip bgp view WORD * ipv4 multicast soft in
clear ip bgp view WORD * ipv4 multicast soft out

clear ip bgp view WORD * ipv4 unicast in
clear ip bgp view WORD * ipv4 unicast soft
clear ip bgp view WORD * ipv4 unicast soft in
clear ip bgp view WORD * ipv4 unicast soft out
clear ip bgp view WORD * soft
clear ip bgp view WORD * soft in
clear ip bgp view WORD * soft out

clear ip fastpath statistics

clear ip igmp
clear ip igmp group *
clear ip igmp group A.B.C.D
clear ip igmp interface IFNAME
clear ip igmp vrf NAME
clear ip igmp vrf NAME group *
clear ip igmp vrf NAME group A.B.C.D
clear ip igmp vrf NAME interface name

clear ip isis WORD route all
clear ip isis WORD route redistribution
clear ip isis route

clear ip mroute *
clear ip mroute * pim dense-mode
clear ip mroute * pim sparse-mode
clear ip mroute A.B.C.D
clear ip mroute A.B.C.D A.B.C.D
clear ip mroute A.B.C.D A.B.C.D pim dense-mode
clear ip mroute A.B.C.D A.B.C.D pim sparse-mode
clear ip mroute A.B.C.D pim sparse-mode
clear ip mroute statistics *
clear ip mroute statistics A.B.C.D
clear ip mroute statistics A.B.C.D A.B.C.D
clear ip mroute vrf NAME *
clear ip mroute vrf NAME * pim dense-mode
clear ip mroute vrf NAME * pim sparse-mode
```

```
clear ip mroute vrf NAME A.B.C.D
clear ip mroute vrf NAME A.B.C.D A.B.C.D
clear ip mroute vrf NAME A.B.C.D pim dense-mode
clear ip mroute vrf NAME A.B.C.D pim sparse-mode
clear ip mroute vrf NAME statistics *
clear ip mroute vrf NAME statistics A.B.C.D
clear ip mroute vrf NAME statistics A.B.C.D A.B.C.D
```

```
clear ip nat statistics
```

```
clear ip ospf process
```

```
clear ip pim sparse-mode bsr rp-set *
clear ip pim vrf NAME sparse-mode bsr rp-set
```

```
clear ip prefix-list
clear ip prefix-list WORD
clear ip prefix-list WORD A.B.C.D/M
```

```
clear ip route kernel
```

where:

| | | |
|--------------------|-------------------|---|
| bgp * | | All Border Gateway Protocol (BGP) information |
| | in | Soft reconfig inbound update |
| | prefix filter | Push out prefix-list ORF and do inbound soft reconfig |
| | ipv4 multicast in | Soft reconfig inbound update |
| | out | Soft reconfig outbound update |
| | soft | Soft reconfig |
| | ipv4 unicast in | Soft reconfig inbound update |
| | out | Soft reconfig outbound update |
| | soft | Soft reconfig |
| | in | Soft reconfig inbound update |
| | out | Soft reconfig outbound update |
| | ipv6 unicast in | Soft reconfig inbound update |
| | out | Soft reconfig outbound update |
| | soft | Soft reconfig |
| | in | Soft reconfig inbound update |
| | out | Soft reconfig outbound update |
| | l2vpn evpn in | L2VPN address family, soft reconfig inbound update |
| | out | Soft reconfig outbound update |
| | soft | Soft reconfig |
| | in | Soft reconfig inbound update |
| | out | Soft reconfig outbound update |
| | out | Soft reconfig outbound update |
| | soft | Soft reconfig |
| | in | Soft reconfig inbound update |
| | out | Soft reconfig outbound update |
| | vpn4 unicast in | Soft reconfig inbound update |
| | out | Soft reconfig outbound update |
| | soft | Soft reconfig |
| | in | Soft reconfig inbound update |
| | out | Soft reconfig outbound update |
| | vpn6 unicast in | Soft reconfig inbound update |
| | out | Soft reconfig outbound update |
| | soft | Soft reconfig |
| | in | Soft reconfig inbound update |
| | out | Soft reconfig outbound update |
| | vrf WORD | VPN Routing/Forwarding instance name |
| | in | Soft reconfig inbound update |
| | out | Soft reconfig outbound update |
| | soft | Soft reconfig |
| | in | Soft reconfig inbound update |
| | out | Soft reconfig outbound update |
| bgp <1-4294967295> | | Clear peers with the AS number |
| fastpath | | Fastpath information (see Exe mode's clear ip) |
| igmp | | IGMP (see Exe mode's clear ip) |
| isis | | IS-IS information (see Exe mode's clear ip) |
| mroute | | Multicast route table entries (see Exe mode's clear ip) |
| nat | | NAT information (see Exe mode's clear ip) |

```

ospf process      Reset Shortest Path First (OSPF) process
pim              PIM information (see Exe mode's clear ip)
prefix-list     Prefix list
                WORD
                Prefix list name
                A.B.C.D/M IP prefix <network>/<length>, e.g., 35.0.0.0/8
route kernel    Stale kernel route

```

clear ipv6

Remove Internet Protocol version 6 (IPv6) information.

Syntax

```

clear ipv6 access-list
clear ipv6 access-list WORD

clear ipv6 bgp * vrf WORD
clear ipv6 bgp * vrf WORD in
clear ipv6 bgp * vrf WORD out
clear ipv6 bgp * vrf WORD soft
clear ipv6 bgp * vrf WORD soft in
clear ipv6 bgp * vrf WORD soft out
clear ipv6 bgp X:X::X:X
clear ipv6 bgp X:X::X:X vrf WORD in
clear ipv6 bgp X:X::X:X vrf WORD out
clear ipv6 bgp X:X::X:X vrf WORD soft
clear ipv6 bgp X:X::X:X vrf WORD soft in
clear ipv6 bgp X:X::X:X vrf WORD soft out

clear ipv6 fastpath statistics

clear ipv6 isis WORD route all
clear ipv6 isis WORD redistribution
clear ipv6 isis route all
clear ipv6 isis route redistribution

clear ipv6 neighbors

clear ipv6 prefix-list
clear ipv6 prefix-list WORD
clear ipv6 prefix-list WORD X:X::X:X/M

clear ipv6 route kernel

```

where:

| | |
|----------------------|---|
| access-list | IPv6 access lists stats |
| WORD | IPv6 ZebOS access-list name |
| bgp | Border Gateway Protocol (BGP) information |
| * | Clear all peers |
| vrf | VPN Routing/Forwarding instance |
| WORD | VPN Routing/Forwarding instance name |
| in | Soft reconfig inbound update |
| out | Soft reconfig outbound update |
| soft | Soft reconfig |
| X:X::X:X | BGP neighbor address to clear |
| fastpath | Fastpath information |
| isis WORD | IS-IS information, ISO routing area tag |
| route all | Entire IS-IS routing table |
| route redistribution | ISIS IP local redistribution routes |
| neighbors | IPv6 neighbor information |
| prefix-list | Prefix list information |
| WORD | |
| route kernel | Routing table information, stale kernel route |

clear l2vpn statistics

Remove L2 VPN service and tunnel information.

Syntax

```
clear l2vpn statistics
```

clear mac

Remove MAC information.table in hardware.

Syntax

```
clear mac hw-table  
clear mac hw-table address MAC  
clear mac hw-table vlan VLAN  
clear mac-sw-table
```

where:

| | |
|-------------|-------------------------------|
| hw-table | Hardware MAC address database |
| address MAC | Hexadecimal MAC address |
| vlan VLAN | VLAN ID |

configure

Enter configuration (CONFIG) mode.

Syntax

| | |
|-----------|-----------------------------|
| configure | Enter configuration mode |
| terminal | Configure from the terminal |

copy

Copy from one file to another.

Syntax

```
copy WORD WORD  
copy WORD startup-config  
copy running-config WORD  
copy running-config startup-config  
copy startup-config WORD
```

where:

| | |
|---------------------|---|
| WORD WORD | Source and destination URLs or local filenames |
| startup-config | Copy to startup configuration |
| running-config WORD | Copy from current system configuration to destination URL or local filename |
| startup-config | Copy from current system configuration to startup configuration |
| startup-config WORD | Copy from startup configuration to Destination URL or local filename |

delete

Remove a local file.

Syntax

```
delete WORD  
delete startup-config
```

where:

| | |
|----------------|---|
| WORD | Local filename to delete |
| startup-config | Persistent configuration. Rebooting without saving would bring the system back to a default state |

dir

List the contents of the local file system. The displayed columns are defined as follows.

- First column shows the file size in bytes.
- Second column shows the time/date the file was last written.
- Third column shows the file name.

Syntax

```
delete dir
```

disable

Disable PRIV-EXEC mode and return to EXEC mode.

Syntax

```
disable
```

enable

Enable PRIV-EXEC mode. Issued from the EXEC mode.

Syntax

```
Enable
```

exit

End current mode and down to previous mode.

Syntax

```
exit
```

fabric clear-fabric-id

Description

When connecting fabric modules that were previously in a fabric to a new fabric, the fabric modules do not automatically join the new fabric until you issue the `fabric clear-fabric-id` command. This behavior is to ensure that the modules can be easily returned to the previous fabric if necessary.

To join the new fabric, the fabric modules must have no fabric identifier just as a new module has no fabric identifier. The `fabric clear-fabric-id` command clears the fabric identifier from the fabric modules that were in the previous fabric and are now connected to the new fabric. After the fabric identifier has been cleared, the fabric modules that were already in the fabric assign their shared fabric identifier to the newly-connected fabric modules, and the newly-connected modules join the new fabric.

CAUTION: Only use this command on a new fabric module being brought into an existing fabric. Using this command on an existing fabric module from the target fabric may result in unwanted consequences.

Syntax

```
fabric clear-fabric-id
```

help

Description of the interactive help system.

Syntax

```
help
```

hold

Enable administrative hold on an interface.

Syntax

```
hold IFNAME
```

where:

```
IFNAME          Interface name
```

hold-policy default-topology

Port holddown policy.

Syntax

```
hold-policy default topology disable  
hold-policy default topology enable
```

where:

```
disable          Disable automatic holddown when default topography is unavailable  
enable          Enable automatic holddown when default topography is unavailable
```

install

Install a package file (tarball) that was previously copied locally, to the alternate boot partition. A confirmation is requested of the user before proceeding.

Syntax

```
Install FILE
```

where:

```
FILE            Package file name
```

ip nat private

Internet Protocol (IP)

Syntax

```
ip nat private source static A.B.C.D A.B.C.D  
ip nat private vlan VLAN
```

where:

| | |
|----------------|--|
| source | Source address |
| static A.B.C.D | Static private local IP address (A.B.C.D) |
| A.B.C.D | Translated global IP address (A.B.C.D) |
| Vlan VLAN | VLAN id to set as private interface <1-4000> |

lldp port

Enable or disable the reception of LLSP PDUs on a specific port.

Syntax

```
lldp port IFNAME receive disable  
lldp port IFNAME receive enable
```

where:

| | |
|-----------------|--------------------|
| IFNAME | LAG interface name |
| receive disable | Disable receive |
| receive enable | Enable receive |

logout

Exit the CLI session.

Syntax

```
exit
```

move

Rename a local file.

Syntax

```
Move WORD WORD
```

where:

| | |
|---------|------------------------------|
| WORD(1) | Local filename to be renamed |
| WORD(2) | New name for local file |



mstat

Show statistics after multiple multicast traceroutes.

Syntax

```
mstat
mstat A.B.C.D
mstat A.B.C.D A.B.C.D
mstat A.B.C.D A.B.C.D A.B.C.D
mstat A.B.C.D A.B.C.D A.B.C.D <1-255>
```

where:

| | |
|------------|--|
| A.B.C.D(1) | Source to trace route from |
| A.B.C.D(2) | Destination of multicast trace |
| A.B.C.D(3) | Group for multicast trace or 0.0.0.0 |
| <1-255> | Time-To-Live for multicast trace request |

mtrace

Trace multicast path from source to destination.

Syntax

```
mtrace
mtrace A.B.C.D
mtrace A.B.C.D A.B.C.D
mtrace A.B.C.D A.B.C.D A.B.C.D
mtrace A.B.C.D A.B.C.D A.B.C.D <1-255>
```

where:

| | |
|------------|--|
| A.B.C.D(1) | Source to trace route from |
| A.B.C.D(2) | Destination of multicast trace |
| A.B.C.D(3) | Group for multicast trace or 0.0.0.0 |
| <1-255> | Time-To-Live for multicast trace request |

no

Negate a command or set its defaults.

Syntax

```
no debug all
no debug bgp
no debug ip
no debug ipv6
no debug isis
no debug l2-isis
no debug mrd
no debug nsm
no debug ospf
no debug pim
no debug pip
no debug prd
no debug vrf
no ip
```

where:

| | |
|-----------|---|
| debug all | Debugging functions, all debugging |
| bgp | Border Gateway Protocol (BGP) |
| ip | Internet Protocol (IP) |
| ipv6 | Internet Protocol version 6 (IPv6) |
| isis | Intermediate System - Intermediate System (IS-IS) |
| l2-isis | L2 IS-IS Routing Daemon |
| mrd | Multicast Route Daemon (MRD) |
| nsm | Network Service Module (NSM) |
| ospf | Open Shortest Path First (OSPF) |
| pim | Protocol Independent Multicast (PIM) |
| pip | Plexxi Imi Proxy Daemon (PIP) |
| prd | Plexxi Route Daemon (PRD) |
| vrf | VPN routing/forwarding instance |

ptp

Enable or disable Precision Time Protocol (PTP).

Syntax

```
ptp disable
ptp enable
```

where:

| | |
|---------|--------------------------|
| disable | Disable PTP on all ports |
| enable | Enable PTP on all ports |

quit

Exit current mode and down to previous mode.

Syntax

```
quit
```

reload

Reboot the entire device. You can use the rescue option to reboot the fabric module into ONIE rescue mode. A subsequent reboot brings the fabric module back to the previous boot default.

Syntax

```
reload
reload rescue
```

where:

```
rescue          Reboot into ONIE rescue mode
```

rpi

Create or remove a Routed Port Interface (RPI) on the fabric module.

Syntax

```
rpi create rpi-port PORT
rpi create rpi-port PORT tag <1-4000>
rpi delete rpi-port PORT
rpi create rpi-port PORT tag <1-4000>
```

where:

| | | |
|--------|----------|---|
| create | | Create a Routed Port Interface on this fabric module |
| | rpi-port | Access Port or LAG id |
| | PORT | Fabric module fabric port e.g. xp20 or LAG id (1024-1096) |
| | tag | Tagged interface |
| | <1-4000> | Valid tag range |
| delete | | Remove a Routed Port Interface on this fabric module |
| | rpi-port | Access Port or LAG id |
| | PORT | Fabric module fabric port e.g. xp20 or LAG id (1024-1096) |
| | tag | Tagged interface |
| | <1-4000> | Valid tag range |

show Commands

This section describes only the PRIV Exec show commands that are not described in the EXEC Mode section (see “CLI Command Reference – Exec mode”).

show file

Display contents of a local file.

Syntax

```
show file WORD
```

where:

```
WORD          Filename to display
```

show fsat

Display Fully Specified Affinity Topologies (FAST).

Syntax

```
show fsat
```

show loop-detection-stats

Display loop detection port statistics.

Syntax

```
show loop-detection-stat
```

show mac

Display the MAC address database.

Syntax

```
show mac hw-table  
show mac sw-table
```

where:

```
hw-table           Hardware MAC address database  
sw-table           Software MAC address database
```

show peers

Display peer table information.

Syntax

```
show peers
```

show process

Display process information.

Syntax

```
show process
```

show ptp

Display the state of Precision Time Protocol (PTP).

Syntax

```
show ptp
```

show route-map

Display route-map information.

Syntax

```
show route-map  
show route-map WORD
```

where:

```
WORD                Route map name
```

show running-config

Display the current operating configuration.

Syntax

```
show running-config
```


show ssh key

Display the installed SSH key information.

Syntax

```
show ssh
```

show startup-config

Display the contents of the startup configuration.

Syntax

```
show startup-config
```

show tech-support

Display system technical information.

Syntax

```
show tech-support  
show tech-support page
```

where:

```
page                Paginate the command output
```

show topology

Displays topology information.

Syntax

```
show topology dmac  
show topology dmac paths  
show topology dmac state  
show topology residual  
show topology vlan  
show topology vpn
```

where:

```
dmac                DMAC topology information  
  paths             DMAC topology paths  
  state            DMAC topology network state  
residual            Residual topology information  
vlan                VLAN (ISO) topology information  
vpn                 VPN topology information
```

show user-defined-path

Display user-defined paths.

Syntax

```
show user-defined-path  
show user-defined-path full  
show user-defined-path name STRING  
show user-defined-path name STRING full
```

where:

```
full                Show User Defined Path information related to this fabric module  
                    only name  
  STRING            User-defined UDAT name  
  full              Show User Defined Path information related to this fabric module  
                    only
```

support log-bundle

Tech support helper commands.

Syntax

```
support log-bundle
support log-bundle TIME
support log-bundle TIME DAY
support log-bundle TIME DAY MONTH
support log-bundle TIME DAY MONTH YEAR
support log-bundle days DAYS
support log-bundle hours HOURS
```

where:

| | | | |
|-------|-------|------|---|
| TIME | | | Time as HH:MM |
| DAY | | | Day of the month (1-31) |
| | MONTH | | Month number (1=January, 2=February, ...) |
| | | YEAR | Four-digit year |
| days | DAYS | | Number or previous days to gather logs |
| hours | HOURS | | Number or previous hours to gather logs |

verify

Calculate a checksum of a local file using either MD5 or SHA1 hash algorithms. Optionally pass in an expected value for the computed hash to be compared against.

Syntax

```
verify md5 FILE
verify md5 FILE WORD
verify sha
```

where:

| | | | |
|-----|------|------|--|
| md5 | FILE | | Message Digest Algorithm 5, local filename |
| | | WORD | Hash value to compare against |
| sha | FILE | | Secure Hash Algorithm 1, local filename |
| | | WORD | Hash value to compare against |

12 CLI Command Reference – CONFIG mode

IMPORTANT: You must prefix EXEC and PRIV-EXEC commands with the word `do`. For example, to issue a PRIV- EXEC command `boot toggle`, from any CONFIG mode, you must use the following syntax:

```
do boot toggle
```

IMPORTANT: Configuration changes that you make in this mode are immediately saved to running-config and immediately take effect. However, these changes must be copied to startup-config for them to persist to subsequent fabric module reboots and software upgrades.

The CONFIG mode prompt is:

```
cfmod1(config)#
```

access-list

Add an access list entry.

Note: This command is not supported.

Use the no form of the command to remove an entry.

Syntax

```
access-list <1-99> deny A.B.C.D
access-list <1-99> deny A.B.C.D A.B.C.D
access-list <1-99> deny any
access-list <1-99> deny host A.B.C.D
access-list <1-99> permit A.B.C.D
access-list <1-99> permit A.B.C.D A.B.C.D
access-list <1-99> permit any
access-list <1-99> permit host A.B.C.D
access-list <1-99> remark LINE
```

```
access-list <100-199> deny <0-255>
access-list <100-199> deny any
access-list <100-199> deny ethertype
access-list <100-199> deny gre
access-list <100-199> deny igmp
access-list <100-199> deny ip
access-list <100-199> deny ipcomp
access-list <100-199> deny mac
access-list <100-199> deny ospf
access-list <100-199> deny pim
access-list <100-199> deny rsvp
access-list <100-199> deny tcp
access-list <100-199> deny udp
access-list <100-199> deny vrrp
access-list <100-199> permit <0-255>
access-list <100-199> permit any
access-list <100-199> permit ethertype
access-list <100-199> permit gre
access-list <100-199> permit igmp
access-list <100-199> permit mac
access-list <100-199> permit ospf
access-list <100-199> permit pim
access-list <100-199> permit rsvp
access-list <100-199> permit tcp
access-list <100-199> permit udp
access-list <100-199> permit vrrp
access-list <100-199> remark LINE
```

```
access-list <1300-1999> deny A.B.C.D
access-list <1300-1999> deny any
access-list <1300-1999> deny host
```

```

access-list <1300-1999> permit A.B.C.D
access-list <1300-1999> permit any
access-list <1300-1999> permit host
access-list <1300-1999> remark LINE

```

```

access-list <2000-2699> deny <0-255>
access-list <2000-2699> deny any
access-list <2000-2699> deny ethertype
access-list <2000-2699> deny gre
access-list <2000-2699> deny igmp
access-list <2000-2699> deny ip
access-list <2000-2699> deny ipcomp
access-list <2000-2699> deny mac
access-list <2000-2699> deny ospf
access-list <2000-2699> deny pim
access-list <2000-2699> deny rsvp
access-list <2000-2699> deny tcp
access-list <2000-2699> deny udp
access-list <2000-2699> deny vrrp
access-list <2000-2699> permit <0-255>
access-list <2000-2699> permit any
access-list <2000-2699> permit ethertype
access-list <2000-2699> permit gre
access-list <2000-2699> permit igmp
access-list <2000-2699> permit ip
access-list <2000-2699> permit ipcomp
access-list <2000-2699> permit mac
access-list <2000-2699> permit ospf
access-list <2000-2699> permit pim
access-list <2000-2699> permit rsvp
access-list <2000-2699> permit tcp
access-list <2000-2699> permit udp
access-list <2000-2699> permit vrrp
access-list <2000-2699> remark LINE

```

```

access-list WORD deny A.B.C.D/M
access-list WORD deny any
access-list WORD permit A.B.C.D/M
access-list WORD permit any
access-list WORD remark LINE

```

```

access-list zebos WORD deny
access-list zebos WORD permit

```

where:

| | |
|-------------|--|
| <1-99> | Standard access list |
| deny | Specify packets to reject |
| A.B.C.D(1) | Address to match |
| A.B.C.D(2) | Wildcard bits |
| any | Any source host |
| host | A single host address |
| A.B.C.D(1) | Address to match |
| permit | Specify packets to forward |
| remark line | Access list entry comment up to 100 characters |
| <100-199> | Extended access list |
| <1300-1999> | Standard access list (expanded range) |
| <2000-2699> | Extended access list (expanded range) |
| WORD | ZebOS access-list name |
| zebos | ZebOS extended access list |

arp

Set or remove static Address Resolution Protocol (ARP) entry. Optionally, you can indicate a specific interface for an ARP entry.

Use the no form of the command to remove an entry.

Syntax

```
arp A.B.C.D MAC
arp A.B.C.D MAC IFNAME
```

where:

| | |
|---------|--|
| A.B.C.D | IP address of the ARP entry |
| MAC | Mac (hardware) address of the ARP entry in HHHH.HHHH.HHHH format |
| IFNAME | Name of interface associated with this ARP entry |

banner motd

Specify a message of the day login banner or use the default banner.

Use the no form of the command to remove a message.

Syntax

```
banner motd LINE
banner motd default
```

where:

| | |
|---------|----------------|
| LINE | Custom string |
| Default | Default string |

bgp

Configure Border Gateway Protocol (BGP).

Use the no form of the command to remove an entry.

Note: This command is not supported. Use the HPE Composable Fabric Manager UI for configuring IP settings (see the *HPE Composable Fabric Manager UI Guide*).

Syntax

```
bgp aggregate-nexthop-check
bgp config-type standard
bgp config-type zebos
bgp disable-adj-out
bgp extended-asn-cap
bgp multiple-instance
bgp multiple-instance allow-same-peer
bgp nexthop-trigger delay <1-100>
bgp nexthop-trigger enable
bgp rfc1771-path-select
bgp rfc1771-strict
```

where:

| | |
|-------------------------------|---|
| aggregate-nexthop-check | Perform aggregation only when next hop is same |
| config-type | Configuration type |
| standard | Standard |
| zebos | ZebOS |
| disable-adj-out | Disable BGP ADJ_OUT |
| extended-asn-cap | Enable the router to send 4-octet ASN capabilities |
| multiple-instance | Enable bgp multiple instance |
| allow-same-peer | Allow same peer in multiple instances |
| nexthop-trigger delay <1-100> | Nexthop Trigger Delay time interval between 1 and 100 |
| nexthop-trigger enable | Enable nexthop tracking feature |
| rfc1771-path-select | RFC1771 path selection mechanism |
| rfc1771-strict | Strict RFC1771 behavior |

debug

Debugging functions (see also 'undebug').

Use the no form of the command to remove an entry.

Syntax

```
debug bgp
debug bgp all
debug bgp dampening
debug bgp events
debug bgp filters
debug bgp fsm
debug bgp keepalives
debug bgp nht
debug bgp nsm
debug bgp updates

debug ip igmp
debug bgp mrib
debug bgp pim
debug bgp routing

debug ipv6 routing
debug ipv6 routing add-route
debug ipv6 routing delete-route
debug ipv6 routing mod-route

debug isis
debug isis all
debug isis authentication
debug isis checksum
debug isis events
debug isis hello
debug isis ifsm
debug isis local-updates
debug isis lsp
debug isis nfm
debug isis pdu
debug isis protocol-errors
debug isis spf

debug l2-isis
debug l2-isis all
debug l2-isis checksum
debug l2-isis events
debug l2-isis hello
debug l2-isis ifsm
debug l2-isis local-updates
debug l2-isis lsp
debug l2-isis nfm
debug l2-isis pdu
debug l2-isis protocol-errors
debug l2-isis spf

debug mrd
debug mrd all
debug mrd event
debug mrd fib
debug mrd fsm
debug mrd vif

debug nsm
debug nsm all
debug nsm events
debug nsm ha
debug nsm kernel
```

```

debug nsm packet

debug osfp
debug osfp all
debug osfp database-timer
debug osfp events
debug osfp ifsm
debug osfp lsa
debug osfp nfm
debug osfp packet
debug osfp route

debug pim all
debug pim vrf

debug pip
debug pip all
debug pip cfg-cmd
debug pip events

debug prd
debug prd all
debug prd event
debug prd fib
debug prd host
debug prd intf
debug prd nat
debug prd pdu
debug prd vr

```

where:

| | |
|-----------------|---|
| bgp | Border Gateway Protocol (BGP) |
| all | All debugging |
| dampening | BGP dampening |
| events | BGP events |
| evpn | EVPN information |
| filters | BGP filters |
| fsm | BGP Finite State Machine |
| keepalives | BGP keepalives |
| nht | NHT message |
| updates | BGP updates |
| ip | Internet Protocol (IP) |
| igmp | Internet Group Management Protocol (IGMP) |
| mrib | Multicast Routing Information Base (MRIB) |
| pim | Protocol Independent Multicast (PIM) |
| routing | Enable debugging for routing events |
| ipv6 routing | Internet Protocol version 6 (IPv6) |
| add-route | Add route events |
| delete-route | Delete route events |
| mod-route | Modify route events |
| isis | Intermediate System - Intermediate System (IS-IS) |
| all | Enable all debugging |
| authentication | IS-IS authentication |
| checksum | IS-IS check-sum |
| events | IS-IS events |
| hello | IS-IS hello debug |
| ifsm | IS-IS Interface Finite State Machine |
| nfm | IS-IS Neighbor Finite State Machine |
| pdu | IS-IS Protocol Data Unit |
| protocol-errors | IS-IS protocol errors |
| spf | IS-IS SPF calculation |
| l2-isis | L2 IS-IS Routing Daemon |
| all | Enable all debugging |
| checksum | L2 IS-IS check-sum |
| events | L2 IS-IS events |
| hello | L2 IS-IS hello debug |
| ifsm | L2 IS-IS Interface Finite State Machine |
| local-updates | L2 IS-IS Local Updates |
| lsp | L2 IS-IS Link State PDU |

```

n fsm                L2 IS-IS Neighbor Finite State Machine
pdu                  L2 IS-IS Protocol Data Unit
protocol-errors     L2 IS-IS protocol errors
spf                 L2 IS-IS SPF calculation
mrd                  Multicast Route Daemon (MRD)
  all                Enable all MRD debugging
  events             Events
  fib                FIB logs
  fsm                FSM logs
  vif                Interface logs
nsm                  Network Service Module (NSM)
  all                Enable all debugging
  events             NSM events
  ha                 NSM High Availability
  kernel             NSM kernel
  packet             NSM packets
ospf                 Open Shortest Path First (OSPF)
  all                Enable all debugging
  database-timer     OSPF Database Timers
  events             OSPF events information
  ifsm              OSPF Interface State Machine
  lsa                OSPF Link State Advertisement
  nfsm              OSPF Neighbor State Machine
  nsm                OSPF NSM information
  packet             OSPF packets
  route             OSPF route information
pim                  Protocol Independent Multicast (PIM)
  all                All PIM debugging
  vrf                VPN routing/forwarding instance
pip                  Plexxi Imi Proxy Daemon (PIP)
  all                Enable all PIP debugging
  cfg-cmd            Config Cmd log
  events             PIP Event Log
prd                  Plexxi Route Daemon (PRD)
  all                All PRD debugging
  event              Event Logging
  fib                FIB logs
  host               PRD Host Logging
  intf               Vlan Intf logs
  nat                NAT logs
  pdu                PDU logging
  vr                 Virtual Router logs

```

do

Run EXEC and PRIV-EXEC commands from CONFIG mode prompt. This will cause you to leave any sub-mode of the CONFIG mode (e.g. CONFIG-IF or CONFIG-LINE). If the command being run is interrupted (e.g. CTRL-C with 'ping') this may cause you to leave CONFIG mode entirely.

Syntax

```
do LINE
```

where:

```
LINE                EXEC or PRIV-EXEC mode command
```


dump bgp

BGP packet dump.

Syntax

```
dump bgp all PATH
dump bgp all PATH INTERVAL
dump bgp routes-mrt PATH
dump bgp routes-mrt PATH INTERVAL
dump bgp updates
```

where:

| | | |
|-----------------|--------------------|--|
| all PATH | Interval of output | Dump all BGP packets to specified output filename |
| INTERVAL | | |
| routes-mrt PATH | Interval of output | Dump whole BGP routing table to the specified filename |
| INTERVAL | | |

exit

Exit the current mode down to the previous mode.

Syntax

```
exit
```

fib retain

Set the retain time for stale routes in the Forwarding Information Base (FIB) during NSM restart to either forever or to a specific time in seconds. Use the no parameter to revert to the default, which is do not retain NSM routes in the FIB when NSM is killed. NSM still retains the stale routes for 60 seconds when it restarts.

Use the no version of the command to remove an entry.

Syntax

```
fib retain
fib retain forever
fib retain time <1-65535>
```

where:

| | |
|----------------|--|
| forever | Retain FIB forever |
| time <1-65535> | Retain FIB for a specific number of seconds after NSM restarts |

help

Display general help text.

Syntax

```
help
```

interface

Enter CONFIG-IF mode for a specified interface.

Use the no version of the command to remove an entry.

Syntax

```
interface IFNAME
```

where:

```
IFNAME          Interface name
```

ip

Configure Internet Protocol (IP) settings.

CAUTION: This command is not supported. Using it may produce unwanted results. Use the HPE Composable Fabric Manager UI for configuring IP settings (see the *HPE Composable Fabric Manager UI Guide*).

Use the no version of the command to remove an entry.

Syntax

```
ip arp-storm
ip arp-storm holddown
ip arp-storm interval
ip arp-storm threshold
ip as-path access-list
ip community-list <1-99>
ip community-list <100-199>
ip community-list WORD
ip community-list expanded
ip community-list standard

ip extcommunity-list <1-99>
ip extcommunity-list <100-199>
ip extcommunity-list expanded
ip extcommunity-list expanded

ip igmp limit
ip igmp ssm-map
ip igmp vrf

ip inactive-host holddown

ip mroute A.B.C.D/M
ip mroute vrf

ip multicast
ip multicast route-limit
ip multicast unresolved-traffic
ip multicast vrf

ip multicast-routing
ip multicast-routing vrf

ip pim accept-register
ip pim anycast-rp
ip pim bsr-candidate
ip pim cisco-register-checksum
ip pim crp-cisco-prefix
ip pim ignore-rp-set-priority
ip pim jp-timer
ip pim register-rate-limit
ip pim register-rp-reachability
ip pim register-source
```

```
ip pim register-suppression
ip pim rp-address
ip pim rp-candidate
ip pim rp-register-kat
ip pim spt-threshold
ip pim ssm
ip pim vrf
```

```
ip unresolved-host holdown
```

```
ip vrf WORD
```

where:

| | |
|--------------------------|---|
| arp-storm | ARP traffic storm |
| holddown | Delay declaring an ARP storm to be finished |
| interval | Interval between ARP storm checks |
| as-path | BGP autonomous system path filter |
| access-list | Specify an access list name |
| community-list | Add a community list entry |
| <1-99> | Community list number (standard) |
| <100-199> | Community list number (expanded) |
| WORD | Community list name |
| expanded | Add an expanded community-list entry |
| standard | Add a standard community-list entry |
| extcommunity-list | Add an extended community list entry |
| <1-99> | Community list number (standard) |
| <100-199> | Community list number (expanded) |
| expanded | Add an expanded community-list entry |
| standard | Add a standard community-list entry |
| igmp | Internet Group Management Protocol (IGMP) |
| limit | IGMP limit |
| ssm-map | SSM mapping for IGMPv1/v2 groups |
| vrf | VPN Routing/Forwarding instance |
| inactive-host | Hosts that are inactive |
| holddown | Delay deleting inactive host for a period of time |
| mroute | Configure static multicast routes |
| A.B.C.D/M | Source prefix |
| vrf | VPN routing/forwarding instance |
| multicast | Global IP multicast commands |
| route-limit | Maximum number of multicast routes |
| unresolved-traffic | Unresolved traffic |
| vrf | VPN Routing/Forwarding instance |
| multicast-routing | Enable multicast routing |
| vrf | VPN routing/forwarding instance |
| pim | Protocol Independent Multicast (PIM) |
| accept-register | Register accept filter at RP |
| anycast-rp | Anycast Rendezvous-Point |
| bsr-candidate | Candidate bootstrap router (candidate BSR) |
| cisco-register-checksum | Calculate Register checksum over whole packet (Cisco compatibility) |
| crp-cisco-prefix | To be a C-RP working with Cisco BSR |
| ignore-rp-set-priority | Ignore RP set priority value |
| jp-timer | Join/Prune timer |
| register-rate-limit | Rate limit for PIM Registers |
| register-rp-reachability | Enable RP reachability check for PIM Registers |
| register-source | Source address for PIM Register |
| register-suppression | Register Suppression for PIM Registers |
| rp-address | PIM RP-address (Rendezvous Point) |
| rp-candidate | PIMv2 RP-candidate |
| rp-register-kat | KAT for (S,G) at RP from PIM Registers |
| spt-threshold | Source-tree switching threshold |
| ssm | Configure Source Specific multicast |
| vrf | VPN Routing/Forwarding instance |
| unresolved-host | Hosts that have not been resolved |
| holddown | Discard traffic for a period of time |
| vrf | VPN routing/forwarding instance |
| WORD | VPN Routing/Forwarding instance name |

ipv6

Configure Internet Protocol version 6 (IPv6) settings.

CAUTION: This command is not supported. Using it may produce unwanted results. Use the HPE Composable Fabric Manager UI for configuring IPv6 settings (see the *HPE Composable Fabric Manager UI Guide*).

Syntax

```

ipv6 access-list WORD
ipv6 access-list WORD deny
ipv6 access-list WORD permit
ipv6 access-list WORD remark

ipv6 mroute X:X::X/M
ipv6 mroute X:X::X/M INTERFACE
ipv6 mroute X:X::X/M X:X::X:X
ipv6 mroute X:X::X/M bgp
ipv6 mroute X:X::X/M isis
ipv6 mroute X:X::X/M ospf
ipv6 mroute X:X::X/M rip
ipv6 mroute X:X::X/M static
ipv6 mroute vrf NAME

ipv6 neighbor X:X::X:X IFNAME

ipv6 prefix-list WORD deny
ipv6 prefix-list WORD description
ipv6 prefix-list WORD permit
ipv6 prefix-list WORD seq
ipv6 prefix-list sequence-number

```

where:

| | |
|-----------------|---|
| access-list | Access list entry |
| WORD | IPv6 ZebOS access-list name |
| deny | Packets to reject |
| permit | Packets to forward |
| remark | Access list entry comment |
| mroute | Static multicast routes |
| X:X::X/M | Source prefix |
| INTERFACE | RPF interface or pseudo interface Null |
| X:X::X:X | RPF neighbor address or route |
| bgp | Border Gateway Protocol (BGP) |
| isis | ISO IS-IS |
| ospf | Open Shortest Patch First (OSPF) |
| rip | Routing Information Protocol (RIPng) |
| static | Static routes |
| vrf | VPN routing/forwarding instance |
| NAME | VPN routing/forwarding instance name |
| neighbor | IPv6 neighbor |
| X:X::X:X | Neighbor's IPv6 address |
| IFNAME | Interface name |
| prefix-list | Prefix list |
| WORD | Name of a prefix list |
| deny | Packets to reject |
| description | Prefix-list specific description |
| permit | Packets to forward |
| seq | Sequence number of an entry |
| sequence-number | Include/exclude sequence numbers in NVGEN |

line

Enter CONFIG-LINE mode to configure a primary terminal line or virtual terminal.

Use the no version of the command to remove an entry.

CONFIG-LINE mode prompt:

```
*cfmod1-vs1(config-line) #
```

Syntax

```
line console 0  
line vty <0-871>
```

where:

| | |
|---------|-----------------------|
| console | Primary terminal line |
| 0 | First Line number |
| vtty | Virtual terminal |
| <0-871> | First Line number |

log file

Specify settings for system logging.

Use the no version of the command to remove an entry.

Syntax

```
log file FILENAME  
log record-priority  
log stdout  
log syslog  
log trap alerts  
log trap critical  
log trap debugging  
log trap emergencies  
log trap errors  
log trap informational  
log trap notifications  
log trap warnings
```

where:

| | |
|-----------------|--|
| file | Logging to file |
| FILENAME | Logging filename |
| record-priority | Log the priority of the message within the message |
| stdout | Logging goes to stdout |
| syslog | Logging goes to syslog |
| trap | Limit logging to specified level |
| alerts | Alerts |
| critical | Critical |
| debugging | Debugging |
| emergencies | Emergencies |
| errors | Errors |
| informational | Informational |
| warnings | Warnings |

max-fib-routes

Set or clear the maximum number of FIB routes, excluding Kernel, Connect and Static.

Use the no version of the command to remove an entry.

Syntax

```
max-fib-routes <1-4294967294>
```

where:

```
<1-4294967294>      Allowed number of fib routes excluding Kernel, Connect and  
                    Static
```

max-static-routes

Set or clear the maximum number of static routes.

Use the no version of the command to remove an entry.

Syntax

```
max-static-routes <1-4294967294>
```

where:

```
<1-4294967294>      Allowed number of static routes excluding Kernel, Connect  
                    and Static
```

maximum-access-list

Set or clear the maximum number of access list entries.

Use the no version of the command to remove an entry.

Syntax

```
maximum-access-list <1-4294967294>
```

where:

```
<1-4294967294>      Access list limit
```

maximum-paths

Set or clear maximum paths.

Use the no version of the command to remove an entry.

Syntax

```
maximum-paths <1-64>
```

where:

```
<1-64>              Supported multipath numbers
```

no

Negate a command or set its defaults.

Syntax

```
no access-list
no arp
no banner
no bgp
no debug
no dump
no fib
no interface
no ip
no ipv6
no line
no max-fib-routes
no max-static-routes
no maximum-access-list
no maximum-paths
no router-map
no router
no router-id
no service
no virtual-server
```

route-map

Create a route-map.

Use the no version of the command to remove an entry.

Syntax

```
route-map WORD deny <1-65535>
route-map WORD permit <1-65535>
```

where:

| | |
|-----------|--|
| WORD | Route map tag |
| deny | Route map denies set operations |
| permit | Route map permits set operations |
| <1-65535> | Sequence to insert to/delete from existing route-map entry |

router

Enable a routing process.

Use the no version of this command to disable a routing process.

Syntax

```
router bgp <1-4294967295>
router bgp <1-4294967295> view WORD
router l2-isis
router l2-isis WORD
router ospf
```

where:

| | |
|----------------|---|
| bgp | Border Gateway Protocol (BGP) |
| <1-4294967295> | AS number |
| view | BGP view |
| WORD | View name |
| l2-isis | L2 Intermediate System - Intermediate System (Layer2 IS-IS) |
| WORD | ISO routing area tag |
| ospf | Open Shortest Path First (OSPF) |

router-id

Set or clear router identifier for this system.

Use the no version of the command to remove an entry.

Syntax

```
router-id A.B.C.D
```

where:

```
A.B.C.D           Router identifier in IP address format
```

service

Set up miscellaneous service.

Use the no version of the command to remove an entry.

Syntax

```
service advanced-vty
service password-encryption
service terminal-length <0-512>
```

where:

```
advanced-vty           Enable advanced mode vty interface
password-encryption    Encrypt system passwords
terminal-length        System wide terminal length configuration
    <0-512>             Number of lines of VTY (0 means no line control)
```

show

Show running system information.

Syntax

```
show cli
show list
show running-config
```

where:

```
cli                   Show CLI tree of current mode
list                  Show command lists
running-config        Current Operating configuration
```

synce

Configure synce parameters.

Syntax

```
show cli
```




virtual server

Configure the virtual-server parameters.

Syntax

```
virtual-server tcp <0-65535> A.B.C.D <0-65535> WORD  
virtual-server udp <0-65535> A.B.C.D <0-65535> WORD
```

where:

| | | |
|-----|---------------|---------------------|
| tcp | | TCP |
| | <0-65535> (1) | Public port |
| | A.B.C.D | Private IP address |
| | <0-65535> (2) | Private port |
| | WORD | Virtual-server name |
| udp | | UDP |
| | <0-65535> (1) | Public port |
| | A.B.C.D | Private IP address |
| | <0-65535> (2) | Private port |
| | WORD | Virtual-server name |

13 CLI Command Reference – CONFIG-LINE mode

exec-timeout

Specify idle timeout on this line in minutes, seconds, or both.

Use the no form of the command to remove an entry.

Syntax

```
exec-timeout <0-35791>  
exec-timeout <0-35791> <0-2147483>
```

where:

```
<0-35791>           Timeout in minutes  
<0-2147483>       Timeout in seconds
```

end | exit | quit | CTRL-D

Leave the current mode. Note that the end command will exit all the way back to the PRIV-EXEC mode.

Syntax

```
end | exit | quit | CTRL-D
```

help

Display general help text.

Syntax

```
help
```

example:

```
*cfmod1(config-line)# help  
This CLI provides advanced help feature. When you need help,  
anytime at the command line please press '?'.
```

If nothing matches, the help list will be empty and you must backup until entering a '?' shows the available options.

Two styles of help are provided:

1. Full help is available when you are ready to enter a command argument (e.g. 'show ?') and describes each possible argument.
2. Partial help is provided when an abbreviated argument is entered and you want to know what arguments match the input (e.g. 'show ve?').

```
*cfmod1(config-line)#
```

history max

Specify a maximum size for the command history.

Use the no form of the command to remove an entry.

Syntax

```
history max <0-2147483647>
```

where:

```
<0-2147483647>           Number of commands
```

login

Enable or disable local password checking for this line.

Use the no form of the command to remove an entry.

Syntax

```
login  
login local
```

where:

```
local                Local password checking
```

no

Negate a command or set its defaults.

Syntax

```
no exec-timeout  
no history  
no login  
no privilege
```

privilege level

Set the privilege level for this line. The privilege level is either 16 for maximum privilege for this line, or 1-15.

Syntax

```
privilege level 16  
privilege level <1-15>
```

where:

```
16                    Max privilege level for line  
<1-15>               Default privilege level for line
```

show

Show running system information.

Syntax

```
show cli  
show list  
show running-config
```

where:

```
cli                    Show CLI tree of current mode  
list                  Show command lists  
running-config       Current Operating configuration
```

Appendix A Troubleshooting

You can do basic troubleshooting of your HPE Composable Fabric Module using the fabric module CLI commands described in this section. These commands are issued using the PRIV-EXEC CLI mode.

Test Network Connectivity

You can use `ping` and `traceroute` to test network connectivity via the MGMT interface. For example:

```
cfmodl# ping xbuild
PING xbuild (172.17.214.8): 56 data bytes
64 bytes from 172.17.214.8: seq=0 ttl=64 time=0.213 ms
64 bytes from 172.17.214.8: seq=1 ttl=64 time=0.259 ms
64 bytes from 172.17.214.8: seq=2 ttl=64 time=0.193 ms
--- xbuild ping statistics ---
3 packets transmitted, 3 packets received, 0% packet loss
round-trip min/avg/max = 0.193/0.221/0.259 ms
cfmodl# traceroute xbuild
traceroute to xbuild (172.17.214.8), 30 hops max, 46 byte packets
 1 172.17.214.8 (172.17.214.8) 0.220 ms 0.131 ms 0.189 ms
cfmodl#
```

Assess System Health

You can assess the general health of the system using the `show system resources` command.

```
cfmodl# show system resources
top - 14:51:49 up 23:52, 2 users, load average: 0.11, 0.15, 0.14
Tasks: 96 total, 1 running, 95 sleeping, 0 stopped, 0 zombie
Cpu(s): 4.3%us, 0.3%sy, 0.0%ni, 95.4%id, 0.0%wa, 0.0%hi, 0.0%si, 0.0%st
Mem: 3674476k total, 1160188k used, 2514288k free, 41084k buffers
Swap: 0k total, 0k used, 0k free, 998288k cached
us:user sy:system ni:nice id:idle wa:io wait hi:hard irq:soft irq:st:steal time
cfmodl#
```

Display Running Processes

You can display a list of all running processes using the `show process` command.

```
cfmodl# show process
PID   TTY   STAT   TIME   COMMAND
 1     ?    Ss     0:05   init
 2     ?    S      0:00   [kthreadd]
 3     ?    S      0:00   [ksoftirqd/0]
 6     ?    S      0:00   [migration/0]
 7     ?    S      0:00   [watchdog/0]
 8     ?    S      0:00   [migration/1]
. . .
```

You can use output modifiers if you want to check on a particular process.

```
cfmodl# show process | include snmp
20538 ?    S      0:01   /usr/sbin/snmpd -I-ifTable -ifXTable -Lsd -p /var/run/snmpd.pid
20706 pts/1 S+     0:00   egrep snmp
cfmodl#
```

If you suspect any processes might have crashed, you can inspect for the presence of core dump files using the `show system cores` command.

Hardware Status

You can view information about the chassis and hardware using the `show hardware` command.

```
cfmodl# show hardware
Product Data:
-----
System Product Code:    PX-S2E
Part Number:           R0854-F1006-01
Assembly Revision:     2
Chassis Serial Number: D2060F2B055119PE010
Board Type:            CEL_REDSTONE_XP
Board Revision:        2
Board Serial Number:   D2060F2B055119PE010
Manufacturer Code:     CELESTICA
Manufacturing Country: CHN
Base MAC Address:      e039.d790.1000
Number of MAC Addresses: 128
ONIE Version:          plexxi-201504081524
Vendor Name:           Penguin Computing
```

Power Supply Details

For details about the power supplies use the `show hardware power` command.

```
cfmodl# show hardware power
-----
Input Voltage:          123.00 V                Power Supply 1                Power Supply 2
Input Current:          1.28 A
Input Power:            158.00 W
Output Voltage (12V):   12.00 V
Output Voltage (3.3V): 3.34 V
Output Current (12V):   12.12 A
Output Current (3.3V): 0.00 A
Output Power (12V):     144.00 W
Output Power (3.3V):    0.00 W
Inlet Temp:             29.62 C
Outlet Temp:            36.25 C
Fanspeed:               7968 RPM
cfmodl#
```

Temperature Sensor Readings

You can view temperature sensor readings using the `show hardware temp` command.

```
cfmodl# show hardware temp
Temperature Data:
-----
Fan Temp Sensor 0:      31.12 C
Fan Temp Sensor 1:      50.25 C
Fan Temp Sensor 2:      32.50 C
Power Supply 1 Temp Sensor 0: 29.62 C
Power Supply 1 Temp Sensor 1: 36.25 C
Power Supply 2 Temp Sensor 0: 0.00 C
Power Supply 2 Temp Sensor 1: 0.00 C
CPU Module Temp Sensor 0: 33.50 C
Switch Fabric Temp Sensor 0: 48.00 C
Switch Fabric Temp Sensor 1: 51.00 C
...
Switch Fabric Temp Sensor 6: 47.00 C
Switch Fabric Temp Sensor 7: 50.00 C
cfmodl#
```

Fan Status

You can view the status of the fan modules using the `show hardware fans` command.

```
cfmod1# show hardware fans
Chassis Fan Speeds:
-----
Fan 1:    4054 RPM
Fan 2:    4014 RPM
Fan 3:    4093 RPM
Fan 4:    4006 RPM
Fan 5:    4107 RPM
Fan 6:    4014 RPM
cfmod1#
```

Appendix B Working with Support

If you are working with HPE Support, there are several types of log files they might request to troubleshoot a fabric module event such as a reboot.

The commands to generate the files are run from the PRIV-EXEC mode of the fabric module CLI. You must open the PRIV-EXEC CLI mode as described in the next section before continuing.

Opening the PRIV-EXEC Mode

The commands to generate these files are run from the PRIV-EXEC mode of the CLI.

To enter the PRIV-EXEC mode:

1. Open the CLI Shell, at the Bash prompt, enter the following `sudo` command and then enter the password for admin:

```
admin@module:~$ sudo px-shell
```

This opens a prompt such as:

```
cfmod1>
```

For example:

```
admin@cfmod1:~$ sudo px-shell
[sudo] password for admin:
.
.
.
cfmod1>
```

2. Enter the EXEC mode. When you open a fabric module Shell session, you are automatically in the EXEC mode. The prompt is:

```
module>
```

For example, the prompt for a fabric module named **cfmod1**:

```
cfmod1>
```

3. Enter the PRIVILEGED EXEC mode. From the EXEC mode, enter the `enable` command. For example, on fabric module `cfmod1`:

```
cfmod1> enable
cfmod1#
```

The prompt changes from `>` to `#`.

Note: To return to EXEC mode, use the 'disable' command.

Note: If `px-shell` is not invoked using 'sudo', such as would be the case for a Viewer user account whose default shell is `/bin/px-shell`, then the 'enable' command is ineffective and elevated modes are not accessible.

Combining show Command Output

You can combine the output from show commands (such as `version`, the running configuration, system resources, interface information, and other hardware details) using the **show tech-support** command. This combined output enables HPE support to gain a perspective on the current state of the system.

Redirecting show Command Output

When you generate output, you can page through the output of a show command on the screen; however, it is more practical to redirect the show command output to a local file. For example:

```
cfmod1# show tech-support > support_info.txt
```

The file is generated text. For example:

```
cfmod1# dir
User Files:
-----
 243264462      Oct 7 2016 17:27      2.3.0
 434           March 30 2016 16:44   current_config
 380           May 6 2016 10:41     old_config
 28034         Oct 4 2016 15:07     support_info.txt
```

You can then view the contents of the generated text file using the command:

```
cfmod1# show file support_info.txt
```

You can now copy that file off the fabric module to a file server and forward it to HPE Support as requested.

Bundling Log Files

A fabric module records verbose system messages in an internal system log. Because the messages can be quite lengthy, it is not practical to include them in the show tech support output. However, if HPE Support requests these logs, you can use the `support log-bundle` command — available in PRIV-EXEC (or ENABLE) mode — to bundle the requested logs together. The system log files are gathered into an archived bundle named `log-bundle.tar.gz`.

To gather these logs into a bundle for Support:

1. Display the log files in reverse chronological order.
2. Bundle the files using one of the following commands:

```
support log-bundle [days DAYS | hours HOURS]
support log-bundle HH:MM [DAY [MONTH [YEAR]]]
```

If no time period is specified, the command gathers logs from the past 24 hours. However, you can optionally specify a number of days or hours prior, or specify a date and time from which to gather logs.

3. Copy the `log-bundle.tar.gz` file and send it to Support.
4. If you want, you can delete the `log-bundle.tar.gz` file from your system using the delete command. The actual system logs are not affected or modified.

Each time you run the `support log-bundle` command, you overwrite the existing `log-bundle.tar.gz` file.

Specifying the Number of Days to Include in Log Output

If you report that an event occurred recently on a fabric module, Support might ask you to supply a log bundle that covers the period when the event occurred. If an event was "about two days ago", you might be asked to gather three days' worth of logs, as shown in the following example.

```
cfmod1# support log-bundle days 3
Gathering files newer than Sun Jan 20 15:17:19 2016 Written to log-bundle.tar.gz
cfmod1# dir
User Files:
-----
 419           Jan 23 2016 14:02     config.txt
 275604        Jan 23 2016 15:17     log-bundle.tar.gz
```


Specifying a Time

Another example might be an event that occurred at 2:00 a.m. on Christmas Day. Gathering logs from just prior to the event (say, 1:00 a.m.) might be appropriate:

```
cfmodl# support log-bundle 01:00 25 12 2016
Gathering files newer than Tue Dec 25 01:00:00 2016 Written to log-bundle.tar.gz
cfmodl# dir
User Files:
-----
      419          Jan 23 2016 14:02   config.txt
4108450          Jan 23 2016 15:21   log-bundle.tar.gz
```

Copying Fabric Module Core Files

In the rare event of software crashes, the fabric module software creates core files that may provide useful information for Support. This section describes how to copy the core files for transmittal to Support.

Checking for Core Files

To see if system core files have been generated, use the `show system cores` command. For example:

```
cfmodl# show system cores
System Core Files
-----
18358272 Jan 22 2016 13:16 nsm_1358878580_1644.core
```

Copying a Core File to Another Network Host

You can copy the core file from the core file disk space to another network host using the `copy` command and a `core://` style URL to refer to the core filename.

For example:

```
cfmodl# copy core://nsm_1358878580_1644.core scp://<username>@<host>/
<path>/nsm.core
Password:
```

Copying a Core File to Local User Disk Space

You can copy the core file to the local user disk space using the `copy` command and a `core://` style URL to refer to the core filename. For example:

```
cfmodl# copy core://nsm_1358878580_1644.core keep_this_nsm.core
```

You can check for the new filename by using the `dir` command. For example:

```
cfmodl# dir
User Files:
-----
      484          Jan 23 2016 14:02   config.txt
18358272          Jan 22 2016 15:21   keep_this_nsm.core
264629316         Jan 18 2016 09:52   latest.tar.gz
```

IMPORTANT: You cannot copy core files into the fabric module core file area. For example:

```
cfmodl# copy keep_this_nsm.core core://nsm.core
% Bad destination
cfmodl# show system cores
System Core Files:
-----
```

Verifying a Core File in its Original Location

You can verify the fabric module core file is still in its original location.

```
cfmod1# show system cores
```

```
System Core Files:
```

```
-----  
18358272 Jan 22 2016 13:16 nsm_1358878580_1644.core
```

Deleting Core Files

At this point, you may want to delete the original core file and verify its deletion.

```
cfmod1# delete core://nsm_1358878580_1644.core
```

```
cfmod1# show system cores
```

```
System Core Files:
```

```
-----
```

To delete all core files on the system core file disk space, you can use the `clear cores` command.