



*Plexxi Switch
Command Line Interface Guide
Release 2.3.0*

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The Plexxi Switch system is classified as a class 1 telecommunications laser product employing embedded class 1 lasers and complies with the following:

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

PRODUIT CONFORME SELON LE SOUS CHAPITRE J DU DOCUMENT FDA RÈGLE 21 CFR EN VIGUEUR LORS DE LA DATE DE FABRICATION. PRODUIT CONFORME SELON 21CFR 1040.10 ET 1040.11.

Electrotechnical Commission (IEC) 60825-1, 60825-2

This product is classified as a: CLASS 1 LASER PRODUCT

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:

- ï Damage to the eye by viewing an unterminated optical fiber or fiber optic connector.
- ï 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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Welcome

Plexxi provides a command line interface (CLI) for the Plexxi Switch that you can use for initial switch set-up and for troubleshooting functions. You can use the CLI to access information available from Plexxi Control and to quickly display system status Management.

Although you can access some Plexxi Switch configuration commands, in normal operation you use the Plexxi Control graphical user interface (GUI) for most configuration and management functions.



CLI Modes

About the CLI Modes

You work with five different modes when you use the Plexxi CLI. Each mode builds on the prior mode by including the same commands and adding on new ones. The modes are:

- **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 Plexxi Switch.
- **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. The additional commands available in this mode include the ability to make basic changes such as system time and management of local files.
- **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 the `running-config` and immediately take effect. However, these changes must be copied to the `startup-config` in order for them to persist to subsequent switch reboots and software upgrades. Refer to the next major section, "Save Configuration Changes."
 - `running-config` is the current configuration and `startup-config` is the saved configuration.
- **CONFIG-IF** - CONFIG-IF is a sub-mode of CONFIG and is used to manage interfaces.
- **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 switch named 'plexxii' as the prompt example throughout.

Entering the CLI Modes

Entering the EXEC Mode

When you open an SSH CLI session to a switch, you are automatically in the EXEC mode. The prompt is:

```
switch#>
```

For example, the prompt for a switch named plexxii:

```
plexxii>
```

NOTE: Once you leave the EXEC mode and enter the PRIV-EXEC mode, you cannot return to the EXEC mode except by opening a new SSH CLI session to the switch.

Entering the PRIV-EXEC Mode

To enter the PRIVILEGED EXEC mode, from the EXEC mode, enter the `enable` command.

```
plexxil> enable
plexxil#
```

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

Entering the CONFIG Mode

To enter the CONFIG mode, from the PRIV-EXEC mode, enter the `configure` command:

```
plexxil# configure
plexxil(config)#
```

Entering the CONFIG-IF Mode

To enter the CONFIG-IF mode, from the CONFIG mode, enter the `interface mgmt` command:

```
plexxil(config)# interface mgmt
. . .
plexxil(config-if)# exit
plexxil#
```

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:

```
plexxil(config)# line console 0
. . .
plexxil(config-line)# end
plexxil#
```

Exiting the CLI Modes

Returning to the previous 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.

NOTE: You cannot return to the EXEC mode from any mode.

Returning to the PRIV-EXEC mode

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

```
plexxil(config)# end
plexxil#
```

Save Configuration Changes (Persistent Configuration)

You need to save the configuration information you enter using the CLI to have them persist across switch reboots and software upgrades.

When you leave CONFIG mode, if the running-config and the saved startup-config differ, an indicator is shown in the command prompt as an asterisk:

```
plexxil(config)# banner motd "Hello, World"  
*plexxil(config)# end  
*plexxil#
```

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

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

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.

Check Current Configuration

You can check the current state of the system configuration as it is running using the PRIV-EXEC command **show running-config**:

```
plexxil# show running-config
!
service password-encryption
!
ip domain-name plexxi.com
ip name-server 10.10.10.204
ip domain-lookup
!
!
interface lo
 ip address 127.0.0.1/8
 ipv6 address ::1/128
 no shutdown
!
interface mgmt
 ip address 172.17.214.213/16
 ipv6 address fe80::e239:d7ff:fe00:e7f/64
 no shutdown
!
ip route 0.0.0.0/0 172.17.214.1
!
clock timezone US/Eastern
!
!
line con 0
 login
line vty 0 4
 login
!
end
plexxil#
```



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:

```
plexxil# ?
Exec commands:
  boot          Modify boot settings
  clear         Reset functions
  clock        System clock settings
  configure     Enter configuration mode
  controller    Plexxi Controller
  copy         Copy from one file to another
  . . .
  ring         Ring Management
  show         Show running system information
  ssh         Open a SSH connection
  start-shell  Start shell
  support      Tech support helper commands
  telnet      Open a telnet connection
  terminal     Set terminal line parameters
  traceroute  Trace route to destination
  verify      Calculate checksum of a local file
```

```
plexxil#
```

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:

```
plexxil# show ?
  bgp          Border Gateway Protocol (BGP)
  boot         Display partition install and boot setup
  cli         Show CLI tree of current mode
  clock       Display system time and date
  controller  Display current Controller info
  crossbars   Display crossbar status
  . . .
  user-defined-path  User Defined Paths
  users         Display information about terminal lines
  version      Display version info
  virtual-routers  Virtual Router information
  vlan        Display virtual LAN information
  vlog        Vlog show command
plexxil#
```

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

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

Output Modifiers

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

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

```
plexxil# 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:

```
plexxil# 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>
plexxil#
```




Login

You can connect to the Plexxi Switch CLI through a serial console connection, SSH, or Telnet. The serial console runs at 38.4Kbps, 8 data bits, 1 stop bit, and No Parity. Serial access is always enabled and requires physical access to the external serial port of the switch.

By default, SSH access is enabled, but Telnet is not. You can enable or disable both Telnet and SSH as part of the switch configuration.

You are prompted for a username and password when you connect to the switch. The default values are:

- `admin` for username
- `plexxi` for password

After the initial switch setup, you should change the password to something other than the default.

Admin Account

The CLI supports a single `admin` account. You cannot remove this account or add others. You can change the password for the `admin` account using the `username config` command.

```
plexxil(config)# username admin password $herl0ck
*plexxil(config)#
```

Initial Setup

You need to establish the IP settings for the external MGMT port so that the switch can connect to the Central Controller. By default, the MGMT interface is set up as a DHCP client. You can set it using static IP address or set up static DNS.

Static IP Address

Static IP settings can be done with a sequence of commands similar to the following:

```
plexxil(config)# interface mgmt
plexxil(config-if)# no ip address dhcp
plexxil(config-if)# ip address 172.17.214.213/16
plexxil(config-if)# no shutdown
plexxil(config-if)# exit
plexxil(config)# ip route 0.0.0.0/0 172.17.214.1
plexxil(config)#
```

Static DNS Settings

The default DHCP client takes on any DNS settings supplied by the DHCP server. To set up static DNS settings, CONFIG commands similar to the following can be used:

```
plexxil(config)# ip domain-name plexxi.com
plexxil(config)# ip name-server 10.10.10.204
plexxil(config)# ip domain-lookup
plexxil(config)#
```

Point to Controller

You then need to point the switch to the Central Controller to be centrally managed:

```
plexxil# controller set 10.10.11.129
plexxil#
```

Note that the controller address is shared among all switches on the ring. To avoid conflicts, this setting is not saved in the startup-config.

File Handling

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:

```
plexxil# 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
plexxil#
```

- 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 that the special names:

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

Neither of these are housed in the visible local file system space.

Copy, Move, and Delete Examples

The following example shows the use of the `copy`, `move`, and `delete` commands.

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

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

File Copy with URLs

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 switch file system and vice versa.

URLs follow the general form:

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

where username, password and port can be optionally included in the URL or not. The following schemes 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:

```
plexxil# copy current_config sftp://joe@my_server/configs/my_switch/oct3_config
Password:
plexxil#
```

```
plexxil# copy scp://release_server/releases/1.3.0.tar.gz latest_release
Username: jsmith
Password:
plexxil#
```

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.

System Date and Time

You can configure the switch's real time clock using the PRIV-EXEC command `clock set`. The parameters are the time in:

- hours:minutes:seconds
- day of the month
- month number
- 4-digit year

For example:

```
plexxil# clock set 12:05 3 4 2016
Sun Apr 3 12:05:00 EDT 2016
plexxil#
```

Timezone

The switch defaults to a local timezone of US/Eastern. You can change the timezone using the CONFIG command `clock timezone`.

To see the list of acceptable timezone use the `show timezone list` command. You can use the CLI's output modifier capability to scan for specific timezones. For example:

```
plexxil# show timezone list | include US
US/Alaska
US/Aleutian
US/Arizona
US/Central
US/East-Indiana
US/Eastern
US/Hawaii
US/Indiana-Starke
US/Michigan
US/Mountain
US/Pacific
US/Pacific-New
US/Samoa
plexxil#
plexxil# configure
Enter configuration commands, one per line. End with CNTL/Z.
plexxil(config)# clock timezone US/Hawaii
*plexxil(config)# end
*plexxil# show clock
Sun Apr 3 06:13:41 HST 2011
*plexxil#
```

Set Time and Date Using an NTP Server

For more precision, you can set the current date/time from an NTP server:

```
*plexxil# clock set ntp pool.ntp.org
 3 Oct 11:20:10 ntpdate[18950]: step time server 64.73.32.134 offset
47451859.499793 sec
*plexxil# show clock
Wed March 30 11:20:14 HST 2016
*plexxil#
```

These commands set the system clock against the NTP server at the moment the command is run. It does not use the NTP protocol to keep the system clock in sync.

Keep Time Synchronized Using NTP

If you'd like the system's time to stay synchronized using NTP, use the NTP protocol CONFIG commands. Here is one example:

```
*plexxil(config)# clock protocol ntp
*plexxil(config)# ntp server pool.ntp.org prefer
Translating IPv4 address: 50.97.210.169 " " ... OK
*plexxil(config)# end
*plexxil# show ntp associations
address ref clock st when poll reach delay offset disp
~198.110.48.12 128.4.1.1 2 61 64 001 0.0 4294967296.0 7937.5
[ * master (syncd), # master (unsyncd), + selected, - candidate, ~ configured ]
*plexxil#
*plexxil# show ntp status
Clock is synchronized, stratum 3, reference is 198.110.48.12
actual frequency is 4294967295.6510 Hz, precision is 2**-23
reference time is d4172bc6.f247fff3 (21:25:26.946 UTC Wed March 30 2016)
clock offset is 4294967295.998 msec, root delay is 73.103 msec
root dispersion is 0.000 msec,
*plexxil#
```



Update the Software

The Plexxi Switch has a host CPU and an internal solid-state drive. The system runs a specialized Linux OS, with the internal drive partitioned in such a way that there are two installations of software on the drive at any given time.

- One installation runs on the active partition
- One installation sits dormant on the alternate partition

With the two software installations, you can fall back to a previous version as needed.

View Currently Running Software Version

View what version of software that is currently running using `show version`. For example:

```
plexxil# show version
Plexxi Switch version 2.3.0 05/05/16 11:44:35
Copyright (c) 2016 Plexxi, Inc. All rights reserved.
plexxil#
```

Display Versions for Aggregated Components

Display versions for all aggregated components using `show version detail`. For example:

```
plexxil# show version detail
Plexxi Switch version 2.3.0 05/05/16 11:44:35
Copyright (c) 2016 Plexxi, Inc. All rights reserved.
PlexxiSwitch
2.3.0
PlexxiClient
2.3.0
PlexxiClientUpgrade
2.3.0
plexxil#
```

View Installations on Internal Partitions

You can see what is installed on each of the internal partitions by using the `show install` command. The output indicates what software versions are installed on each partition, which partition is currently the running or active partition, and also which partition is the default partition to boot into if the system is reloaded. In the following example, the letter `r` indicates the running partition and the letter `b` indicates the boot partition.)

```
plexxil# show install
Disk partitions [r-running b-boot default]
 r b   A  2.3.0 Built: Thu May  5 11:29:45 EDT 2016 by: releng
      B  2.2.1 Built: Wed March 30 10:29:02 EDT 2016 by: releng
plexxil#
```

Copy Files from Remote Server

Use the `copy` command to copy a switch software release archive to the switch from a remote file server. Once the archive is copied to the switch, you should see it in the output of the `dir` command:

```
plexxil# dir
User Files:
-----
 243264462  Oct 7 2016 17:27  2.3.0_release.tar.gz
  434      March 30 2016 16:44  current_config
  380      May 6 2016 10:41  old_config
plexxil#
```

Install an Update

Use the `install` command to install the update. The `install` command:

1. Validates the archive file.
2. Installs its contents to the alternate non-running partition.
3. Toggles the boot default to the other partition if no errors are encountered.

This leaves the system still running on the original version until it is reloaded, at which time the newly installed version gets used. For example:

```
plexxil# install 2.3.0_release.tar.gz
This action will overwrite all data on the alternate storage partition.
perform install? (y/n): y
Validating 2.3.0_release.tar.gz ...
Preparing alternate partition ...
Installing files ...
Version '2.3.0 r####' successfully installed.
Default boot partition changed to 'A'
plexxil# show install
Disk partitions [r-running b-boot default]
  b  A  2.3.0  r####  Built: Thu May 5 16:46:07 EDT 2016 by: releng
  r  B  2.2.1  r####  Built: Wed March 30 14:13:50 EDT 2016 by: releng
plexxil#
```

You can see version 2.3.0 is successfully installed, but the switch is still running on 2.2.1 for the moment. The indicator for boot default shows that if you reload the switch, it will boot into the new 2.3.0 version. To complete the installation, issue the `reload` command.



Reload to Complete Installation

```
plexxil# reload
reboot system? (y/n): y

. . . <switch reboots> . . .

plexxil# show install
Disk partitions [r-running b-boot default]
 r b   A  2.3.0 Built: Thu May  5 11:29:45 EDT 2016 by: releng
      B  2.2.1 Built: Wed March 30 10:29:02 EDT 2016 by: releng
plexxil#
plexxil# show version
Plexxi Switch version 2.3.0  r#### 10/06/12 16:18:29
Copyright (c) 2016 Plexxi, Inc. All rights reserved.
plexxil#
```

Configuration Persistence

When the new version of software is booted, the saved configuration from the older version is automatically copied over to the new active partition. Also, system logs and the local file system are kept intact between software updates.

Revert to Previously Running Version

You can revert to the previously running version if needed. Note that any configuration changes you made with the newer version running are not copied over. Instead the last saved configuration from the older version is used.

1. Change the boot default to the alternate partition using the `boot toggle` command. For example:

```
plexxil# boot toggle
Default boot partition changed to 'B'
plexxil# show install
Disk partitions [r-running b-boot default]
 r     A  2.3.0 r#### Built: Thu Oct 6 16:46:07 EDT 2016 by: releng
 b     B  2.2.1 r#### Built: Wed March 30 14:13:50 EDT 2016 by: releng
plexxil#
```

2. Boot the previously running version using the `reload` command.

Any configuration changes you saved while running the newer software will not be copied over when reverting to the older software. Instead the configuration as it was saved the last time the older version's partition ran is what will be in place.

SNMP

You configure SNMP using the CONFIG command `snmp-server`.

Community Names

A community name is used for basic authentication for SNMP v1 and v2c access. You can configure a community for read-only (ro) access to the entire MIB. For example:

```
plexxil(config)# snmp-server community general ro
*plexxil(config)# do show snmp community
SNMP Community Names:
Name          Access  Allowed Host/Subnet  MIB View
-----
general      ro      (any)
*plexxil(config)#
```

Restrict Community

You can restrict a community by specifying a:

- predefined MIB view that is accessible for the community
- specific host or IP subnet that is allowed access with that community name

This example shows how to make a read-write community accessible only by the 192.168.1.0/24 subnet and only with accessibility to the set of OIDs defined in the MIB view named system.

```
*plexxil(config)# snmp-server community system_only view system rw allow 192.168.1.0/24
*plexxil(config)# do show snmp community
SNMP Community Names:
Name          Access  Allowed Host/Subnet  MIB View
-----
general      ro      (any)
system_only  rw      192.168.1.0/24      system
*plexxil(config)#
```

MIB Views

You can constrain SNMP clients to a specific subset of the entire MIB using views. You define the view by giving it a name and an OID 'root' that is either included or excluded from the view. You can use either numeric or text-name OIDs.

In this example, the view constrains access to only those OIDs that are part of RFC1213's systemGroup:

```
*plexxil(config)# snmp-server view system-view system included
*plexxil(config)# do show snmp view
View Name          Inclusion          OID
-----
system-view        included          system
*plexxil(config)#
```

In this example the entire MIB is included, while the systemGroup and the ifTable are excluded:

```
*plexxil(config)# snmp-server view no-system-view 1.3.6.1 included
*plexxil(config)# snmp-server view no-system-view system excluded
*plexxil(config)# do show snmp view
View Name          Inclusion          OID
-----
no-system-view     included          1.3.6.1
                   excluded          system
```

```
system-view          included          system
*plexxil(config)#
```

SNMP v3 User-Based Security Model

Version 3 of SNMP introduced a user-based security model (USM) that includes options for user authentication and encryption of information in requests and responses. Each user can be assigned an authentication password using either MD5 or SHA-1 hashing algorithms. They can also be assigned a privacy (encryption) password using DES or AES encryption standards. Additionally, the user is defined with particular access along with its level of security.

In this example a user with a MD5 authentication password and an AES privacy password is given fully encrypted read-only access to the MIB view named system-view:

```
*plexxil(config)# snmp-server user joe view system-view priv ro auth md5 my-secret
priv aes my-other-secret
*plexxil(config)# do show snmp user
SNMP v3 USM User          Auth  Priv  Access  Level  View
-----
joe                        MD5   AES   ro      priv   system-view
*plexxil(config)#
```

Groups

You can give a group of users the same access permissions to the same MIB view by defining a named group and assigning the users to the group. In the example a group is defined that has authenticated, but un-encrypted read-write access to the MIB view named no-system-view.

```
*plexxil(config)# snmp-server group delta auth view no-system-view rw
*plexxil(config)# do show snmp group
Group Name          Access  Security  MIB View
-----
delta                rw      auth      no-system-view
*plexxil(config)#
```

In this example, a new user is assigned to the group. Because this user is assigned to a group that is not using full encryption, there is no need to assign a privacy password.

```
*plexxil(config)# snmp-server user jake group delta auth sha ucantguessthis
*plexxil(config)# do show snmp user
SNMP v3 USM User          Auth  Priv  Access  Level  View
-----
joe                        MD5   AES   ro      priv   system-view
SNMP v3 USM User          Auth  Priv  Group
-----
jake                        SHA           delta
*plexxil(config)#
```

Troubleshooting

You can do basic troubleshooting of your Plexxi Switch using the commands in this section.

Switch Log

You can view the primary system log using the `show log` command. The output shows log entries in reverse-chronological order, so that as you page through the entries, you go back further in time.

```
plexxil# show log
Oct 4 14:34:02 plexxi syslogd 1.5.0: restart.
Oct 4 14:30:01 plexxi crond[1242]: crond: USER root pid 20625 cmd /sbin/hwclock --systohc --
utc
Oct 4 14:22:00 plexxi snmpd[20538]: Turning on AgentX master support.
Oct 4 14:22:00 plexxi snmpd[20538]: NET-SNMP version 5.7.1 restarted
Oct 4 14:22:00 plexxi snmpd[20538]: Reconfiguring daemon
Oct 4 14:21:59 plexxi snmpd[20538]: NET-SNMP version 5.7.1
Oct 4 14:21:59 plexxi snmpd[20536]: Turning on AgentX master support.
Oct 4 14:21:59 plexxi monit[20533]: 'snmpd' start: /etc/init.d/S59snmpd
Oct 4 14:21:58 plexxi NSM[1539]: NSM: AgentX: read, connection (sock 12) closed: length is
zero
Oct 4 14:21:58 plexxi snmpd[20399]: Received TERM or STOP signal... shutting down...
Oct 4 14:21:58 plexxi monit[20524]: 'snmpd' stop: /etc/init.d/S59snmpd
Oct 4 14:21:58 plexxi IMISH[20308]: IMISH: CFG[5] CMD (snmp-server user jake group delta auth
sha ucantguessthis )
Oct 4 14:20:11 plexxi snmpd[20399]: Turning on AgentX master support.
Oct 4 14:20:11 plexxi snmpd[20399]: NET-SNMP version 5.7.1 restarted
Oct 4 14:20:11 plexxi snmpd[20399]: Reconfiguring daemon
Oct 4 14:20:11 plexxi IMISH[20308]: IMISH: CFG[5] CMD (snmp-server group delta auth view no-
system-view rw )
. . .
```

Test Network Connectivity

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

```
plexxil# 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
plexxil# 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
plexxil#
```

Assess System Health

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

```
plexxil# 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:si:soft irq:st:steal time
plexxil#
```

Display Running Processes

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

```
plexxil# 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.

```
plexxil# 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
plexxil#
```

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.

```
plexxil# show hardware
Product Data:
-----
Board Type:          SM2
Board Revision:     1.07
Serial Number:      1211200579
Manufacturer Code:  1
Manufacturing Date: 20MAR2016
Base MAC Address:   e039.d700.0e00
Number of MAC Addresses: 128
System Configuration: All QSFPs as 4x10Gbps
plexxil#
```

Power Supply Details

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

```
plexxil# show hardware power
-----
Power Supply 1          Power Supply 2
-----
Input Voltage:         123.00 V          (not present)
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
plexxil#
```

Temperature Sensor Readings

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

```
plexxil# 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 2:  48.00 C
Switch Fabric Temp Sensor 3:  44.00 C
Switch Fabric Temp Sensor 4:  50.00 C
Switch Fabric Temp Sensor 5:  47.00 C
Switch Fabric Temp Sensor 6:  47.00 C
Switch Fabric Temp Sensor 7:  50.00 C
plexxil#
```

Fan Status

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

```
plexxil# 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
plexxil#
```



Working with Plexxi Care Support

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

Combining Output

You can combine together 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 Plexxi support to gain perspective on the current state of the system.

You can page through all of the output to view it yourself, but a more practical way of using it is to redirect its output to a local file, and then copy that file off the switch to a file server. For example:

```
plexxi1# show tech-support > support_info.txt
plexxi1# 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
plexxi1# show file support_info.txt
*** show version detail ***
Plexxi Switch version 2.3.0  r#### 10/03/12 14:18:29
Copyright (c) 2016 Plexxi, Inc. All rights reserved.
PlexxiSwitch
0.4.32
PlexxiClient
2.3.0-a25

*** show running-config ***
!
service password-encryption
!
username admin password 8 bJbSh8jND7i1A
!
ip domain-name plexxi.com
ip name-server 10.10.10.204
ip domain-lookup
!
snmp-server community "general" ro
. . .
```

Bundling the Log Files

A Plexxi Switch records a number of 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 Plexxi Care 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 Plexxi Care technical support:

1. Display the log files in reverse chronological order by using the show log command in EXEC or PRIV-EXEC mode.
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 Plexxi Care 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.

Specify Number of Days Example

If you report that an event occurred recently on a Plexxi Switch, Plexxi Care technical 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.

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

Specify a Time Example

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.

```
plexxil# 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
plexxil# dir
User Files:
-----
      419          Jan 23 2016 14:02   config.txt
4108450        Jan 23 2016 15:21   log-bundle.tar.gz
```

Copying Plexxi Switch Core Files

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

Check for Core Files

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

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


Copy 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:

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

Copy 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:

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

Note that you cannot copy core files into the Plexxi Switch core file area:

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

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

```
plexxil# 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
```

Verify Core File in Original Location

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

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

Delete Core Files

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

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

Command Reference – Exec mode

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

clear counters IFNAME

Zero the counters for interface IFNAME.

no debug all

Disable all debugging.

debug nsm

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.

```
debug nsm [all|nsm|ha|events|kernel|packet]
no debug nsm [all|nsm|ha|events|kernel|packet]
```

Syntax:

```
[no] debug all nsm
[no] debug nsm (all|)
[no] debug nsm events
[no] debug nsm ha
[no] debug nsm ha all
[no] debug nsm kernel
[no] debug nsm packet (recv|send|) (detail|)
```

disable

Drop to a less privileged exec mode.

enable

Enter a more privileged exec mode.

exit | logout | quit

Leave the CLI session.

help

Display general help info.

ping

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

```
ping [ip] WORD
ping ipv6 WORD [IFNAME]
```

show arp

Display ARP cache.

show cli

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

show clock

Display system time and date.

show debugging nsm

Display current NSM debug setting.

show hardware

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

```
show hardware [detail|fans|power|temp]
```

show history

Display list of previous commands that have been entered in this session.

show hosts

Display domain and IP hostname lookup settings.

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.

```
show interface (IFNAME|) [statistics [errors]]
```

show interface summary

Display a interface information.

While connected to a switch through the Plexxi SSH terminal, issuing the `show interface summary` command returns port status information as shown in the following example.

```
Plexxi3> show interface summary
-----
IFNAME  UserLabel      AdminStatus  LinkStatus  OperStatus  Bandwidth  MTU
-----
lo      mgmt           up           up           up           1g         1500
xp1     xp1            up           down        down        10g       9416
xp2     xp2            up           down        down        10g       9416
xp3     xp3            up           down        down        10g       9416
xp4     xp4            up           down        down        10g       9416
xp5     xp5            up           down        down        10g       9416
xp6     xp6            up           down        down        10g       9416
xp7     xp7            up           down        down        10g       9416
xp8     xp8            up           down        down        10g       9416
...
Plexxi3>
```

show ip arp

Display the ARP cache.

show ip dhcp-relay

Display learned DHCP servers being relayed..

show ip domain-list

Display list of DNS search domains.

show ip domain-name

Display default domain assigned.

show ip igmp snooping

Display IGMP snooping configuration, group info, and multicast router info. Optional VLAN ID may be specified.

```
show ip igmp snooping [vlan VLAN]
show ip igmp snooping groups [vlan VLAN]
show ip igmp snooping mrouter [vlan VLAN]
```

Display IGMP snooping configuration, group info, and multicast router info. Optional VLAN ID may be specified.

show ip interface

Display full, or abbreviated information about one or all IP interfaces.

```
show ip interface [IFNAME] (brief|)
```

show ip name-server

Display configured DNS server IP addresses.

show ip route

Display information from the IP routing table for a specific network, subnet, source, or all.

```
show ip route A.B.C.D
show ip route A.B.C.D/M
show ip route (connected|database|kernel|ospf|static|)
show ip route summary
```

show ipv6 interface

Display abbreviated information about one or all IPv6 interfaces.

```
show ipv6 interface [IFNAME] brief
```

show ipv6 neighbors

Display list of IPv6 neighbors.

show ipv6 route

Display information from the IPv6 routing table for a specific network, subnet, source, or all.

```
show ipv6 route (database|)
show ipv6 route summary
show ipv6 route X:X::X:X
show ipv6 route X:X::X:X/M
```

show lacp

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

```
show lacp [IFNAME]
```

show lacp lag

Display LACP information for all LAGs (or one specified LAG). This command has the same output as `show lag lacp`.

```
show lacp lag [IFNAME]
```

show lag

Display information on link aggregations. Optionally, indicate one specific LAG interface.

```
show lag [IFNAME]
```

show lag lacp

Display LACP information for all LAGs (or one specified LAG) This command has the same output as `show lacp lag`.

```
show lag lacp [IFNAME]
```

show lag IFNAME vlan

Display what VLANs are applied to a specific LAG.

```
show lag IFNAME vlan
```

show list

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

show lldp

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

```
show lldp [detail]
```

show lldp local-info

Displays the Link Layer Discovery Protocol (LLDP) local node information. For detailed view, you need to provide the interested port name.

```
show lldp local-info[IFNAME]
```

show lldp neighbor-info

Displays the Link Layer Discovery Protocol (LLDP) remote/neighbor nodes information. For detailed view, you need to provide the interested port name.

```
show lldp neighbor-info [IFNAME]
```

show locate-led

Display the current state (ON/OFF) of the LOC_ID LED on the switch front panel. For example:

```
show locate-led
LocId LED is now OFF
```

show log

Display system log entries.

show ntp associations

Display NTP associations.

```
show ntp associations [detail]
```

show ntp status

Display status of NTP.

show post

Display information related to Power-On Self Test results.

show privilege

Display current privilege level.

show qinq svlan

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

```
show qinq svlan [SVLANID]
```

show qsfp

Display current QSFP configuration settings such as redirect and control channel.

show ring

Display Plexxi Ring configuration.

show router-id

Display router identifier.

show sflow

Display sFlow parameters and operational status.

show sflow interface

Display sFlow status and statistics per port.

```
show sflow interface [IFNAME]
```

show policer config

Display the configured policers. You can specify port identifier, VLAN ID, or LAG number.

```
show policer config [port IFNAME|vlan VLAN|lag <1024-4294967295>] [detail]
```

show policer statistics

Display the policer statistics. You can filter the results by flow ID.

```
show policer statistics [flow-id <0-4294967295>] [detail]
```

show snmp community

Display configured SNMP community names.

show snmp engineID

Displays the current value of the local SNMP agent's engineID.

show snmp group

Displays any v3 user access groups that have been configured.

show snmp host

Display configured hosts to receive SNMP traps.

show snmp trap

Displays enable state for various trap types (e.g. link changes, SNMP auth failures).

show snmp user

Displays configured v3 USM users.

show snmp view

Displays configured VACM MIB views.

show system resources

Display resource usage such as CPU, Memory, etc.

show system uptime

Display time the system has been running.

show timezone

Display the current timezone setting. Using the `list` option gives you a list of all acceptable timezones, which are configured using the `clock timezone` command.

```
show timezone [list]
```

show topography

Display ring status and neighbor information.

show transceivers

Display transceiver status and info.

show translation tvlan

Displays translated VLAN information or for a specific translated VLAN ID.

```
show translation tvlan [TVLANID]
```

show users

Display list of user sessions currently connected.

show version

```
show version [detail]
```

Display running version of software. Option 'detail' shows extra version info about software components.

show virtual-routers

Display any virtual routers that exist and their status.

show vlan

Display virtual LAN information for all VLANs or one VLAN in particular. QinQ information is also included. To display tunnels, use the `tunnel` argument instead of a VLAN ID.

```
show vlan [VLAN ID | tunnel]
```

show vlan group

Display virtual LAN groups and the member VLAN IDs. This includes QinQ information.

show vlan translation

Display virtual LAN translation information.

ssh

Open a SSH connection to `username@hostname` or `username@IPAddress`:

```
ssh ( username@hostname | username@IPAddress )
```


telnet

Open a TELNET connection to a host at a host name or IP address. If a *PORT* is not given, the default is 23.

```
telnet (hostname | IPAddress) [PORT]
```

terminal length

Adjust the number of lines for this session's terminal.

```
terminal length (<0-512>)  
terminal no length
```

terminal monitor

Use this session to monitor (display) debug output.

```
terminal monitor  
terminal no monitor
```

traceroute

Execute a traceroute to a host. If no arguments are given, the command is interactive.

```
traceroute [ip|ipv6] [hostname|IPAddress]
```

Command Reference – PRIV-EXEC mode

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

boot toggle

Toggle the active boot partition so the alternate partition runs on the next `reload`.

clear arp-cache

Remove all dynamic ARP entries.

clear controller address

Clear configured address for Plexxi Controller.

clear controller config

Removes any configurations on the switch that originated from the controller and to remove any configuration it has that is associated with the switch. With the `partial` argument, it removes any configurations on the switch that originated from the controller.

```
clear controller config
clear controller config partial
```

clear cores

Delete any existing core files on the system.

clear hold

Disable administrative hold on one specific interface or all interfaces.

```
clear hold <IFNAME | all>
```

clear ip route kernel

Remove stale IP routes sourced by the kernel.

clear ipv6 neighbors

Remove all learned IPv6 neighbors.

clear ipv6 route kernel

Remove stale IPv6 routes sourced by the kernel.

clear mac hw-table

Clear out the MAC table in hardware. You can specify a single address or a specific VLAN.

```
clear mac hw-table <address MAC> | <vlan VLAN>
```

clear policer statistics

Clear the statistics for a policer. With flow-id argument, clears the policer for the specified flow.

```
clear policer [flow-id <0-42949667295>]
```

clock set

Set system clock to hours and minutes.

```
clock set HH:MM[:SS] [ DAY [ MONTH [ YEAR ] ] ]
```

The valid ranges are:

- SS (0 to 59 seconds)
- DAY (1 to 31)
- MONTH (1 to 12)
- YEAR (four digits).

clock set ntp HOST

Perform a one-time sync now with the NTP server HOST. Not usable when full NTP is configured.

configure (terminal)

Enter CONFIG mode.

controller set HOST

Set address for Plexxi Controller.

copy FILE

Save local file to the persistent storage to be loaded on reboot, or to a different local file, or to a remote URL.

```
copy FILE <FILE> <startup-config> <URL>
```

copy running-config

Save all running settings to the persistent storage to be loaded on reboot, or to a local file, or to a remote URL.

```
copy running-config <startup-config> <FILE> <URL>
```

copy startup-config

Save persistent storage to a local file, or to a remote URL.

```
copy startup-config <FILE> <URL>
```

copy URL

Save remote URL to local file or to persistent storage to be loaded on reboot.

```
copy URL <FILE> <startup-config>
```

delete FILE

Delete a local file.

```
delete FILE <FILE>
```

delete startup-config

Deletes persistent configuration; rebooting without saving would bring the system back to a default state.

dir

List the contents of the local file system:

```
plexxil# dir
User Files:
-----
 502905375   May  5 2016 12:03   SwitchPlatform.install

Disk partition is 16% full
plexxil#
```

The columns are defined as follows.

- 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.

exit|logout|quit

Leave the current CLI session.

hold IFNAME

Enable administrative hold on an interface.

install <FILE>

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

lldp port IFNAME receive

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

```
lldp port IFNAME receive (enable|disable)
```

locate-led

Illuminate or extinguish LOC_ID LED on the Plexxi Switch faceplate. When you set the LED on you can either specify number of minutes or retain the default value of 1440 minutes.

```
locate-led <on [MINS]> <off>
```

move *FILE*

Rename a local file.

```
move FILE <FILE>
```

qsfp config

For Plexxi Switch 1 hardware only. (You can use Plexxi Control GUI to configure QSFP+ ports on Plexxi Switch 1x and 2 platforms.) Configure the QSFP mode of operation (1x40 vs. 4x10). User confirmation required. An immediate system reload is imposed if a change is made.

reload (rescue)

Reboot the entire device. You can use the rescue option to reboot the Plexxi Switch into ONE rescue mode. A subsequent reboot brings the Plexxi Switch back to the previous boot default.

ring confluent-ring-links

Configure the number of links to be used in the confluent ring LAG. The number of links is between 1-4. `clear` clears this configuration and reverts it to default.

```
ring confluent-ring-links (<1-4> | clear)
```

ring control (in-band|out-of-band) [force]

Configure whether the control plane traffic channel is in- or out-of-band. The optional [force] argument is only needed special cases where a Plexxi Switch is moved or Plexxi Rings with opposing settings are merged.

ring redirect (for Switch 2e)

Brief Description

Remap all Switch 2e east, west, or east-and-west fabric pathways from QSFP ports to SFP+ ports.

Syntax

```
ring redirect (west-sfp | east-sfp | west-sfp-east | west-east) (east-speed | west-speed) (east-egress-rate | west-egress-rate)
```

Argument	Description	Values
<code>west-east</code>	From West to East (default).	
<code>west-sfp</code>	Remaps the twelve 10GbE uplinks represented by the top 3 QSFP ports (Q1, Q3, Q5) to the last 12 SFP+ top ports (odd-numbered ports 25-47). The QSFP ports become access ports.	
<code>east-sfp</code>	Remaps the twelve 10GbE uplinks represented by the bottom 3 QSFP ports (Q2, Q4, Q6) to the last 12 bottom SFP+ ports (even-numbered ports 26-48). The Q2, Q4 and Q6 become access ports	
<code>west-sfp-east</code>	Remaps both west and east QSFP ports to the corresponding SFP+ ports. All QSFP ports become access ports. Also set the west and east speeds and egress rates.	
<code>east-speed</code>	Set the line speed of the East or West confluent ring.	10G Set speed to 10 Gb/s.
<code>west-speed</code>		1G Set speed to 1 Gb/s. The default is 10G.
<code>east-egress-rate</code>	Configure the east or west confluent ring egress shaping.	<code><1-10000></code> Set to the provisioned rate for the service. 1000 = 1 Gb/s and 400 = 400 Mb/s. These commands require a value. Once set, to remove any shaping on a link, the command must be given with the full line speed as the value.
<code>west-egress-rate</code>	Set the value of egress rate in Mbps; it cannot be more than the line speed.	

Description

When used on a Switch 2e, this command configures (remaps or redirects) all Switch 2e east, west, or east-and-west Plexxi fabric pathways from QSFP ports to corresponding SFP+ ports, as defined by the following mapping arguments:

QSFP west port	To SFP+ west ports	QSFP east port	To SFP+ east ports
Q1	25, 27, 29, 31	Q2	26, 28, 30, 32
Q3	33, 35, 37, 39	Q4	34, 36, 38, 40
Q5	41, 43, 45, 47	Q6	42, 44, 46, 48

When you execute the ring redirect command and modify the redirect mode, the switch must be rebooted for the configuration to be updated. Changing the speed or egress shaping does not require a reboot.

For example, reboot the switch as prompted when the following command is issued:

```
ring redirect west-sfp
The ring engagement mode is being changed. This will cause a reboot. You want to reboot?
(y/n)y
```

Note that a reboot is required only when changing the ring engagement mode. Changing speed and/or egress rate for a switch using the current engagement mode will take effect immediately. For example, to change the speed and egress shaping on a switch currently in west-sfp enter the following command.

```
ring redirect west-sfp east-speed 1G east-egress-rate 400
A reboot is not required.
```

ring redirect (for Switch 2, 2p, 2sp)

Brief Description

Configure the Plexxi fabric (Plexxi Ring) pathway using Flexx ports.

Syntax

```
ring redirect (west-east|west-flexx|east-flexx|west-flexx-east)
```

Description

Redirecting LightRail Optical Paths to Flexx Ports

You can redirect optical paths using the Layer 1 optical cross-connect. Switch 2, 2p and 2sp have additional optical components and SFP+ Flexx ports that you can use to redirect WDM waves. The WDM waves can be turned into 80 km DWDM waves for longer distances as individual 10GbE connections that become part of the Plexxi fabric mesh, using external DWDM SFP+ Transceivers

You can extend the ring by using the ring engagement modes and configuring data paths through the switches using the SFP+ Flexx ports. With this capability you can enable a true multisite fabric rather than two separate fabrics that are connected with IP and regular routing protocols.

Ring Engagement Modes

You can extend the Plexxi Ring by using the ring engagement modes and configuring data paths through the switches using the SFP+ Flexx ports. With this capability you can enable a true multisite fabric rather than two separate fabrics that are connected with IP and regular routing protocols. When you assign a ring engagement mode other than the default of WEST-EAST, you are causing the packet switching ASIC to direct the LightRail wave to a Flexx port instead of to a switch port (default). Changing the ring engagement mode changes the paths that are under switch control. To create a data path from one switch to another, you need to configure the ring engagement modes for both switches.

Engagement Mode	Description
WEST-EAST	Default switch configuration; No Flexx ports used.
WEST-FLEXX	On a West Flexx node, East is replaced by Flexx (redirect East to Flexx port)
EAST-FLEXX	On a East Flexx node, West is replaced by Flexx (redirect West to Flexx port)
WEST-FLEXX-EAST	Combines the WEST-FLEXX and EAST-FLEXX options (For example, if one switch connects two data centers.)

show arp

Display ARP cache.

show boot

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

show controller

Display current configured hostname/IP for the controller.

show debugging snmp

Display current SNMP settings.

show file

List contents of a local file.

```
show file <FILE>
```

show flow

Display configured User Defined Topology (UDT) or statistics for existing UDTs.

```
show flow (config|stats)
```

For example:

```
plexxil# show flow config
flow create TestFlow priority 1 egress-ports xp67 cir 3000 cbs 3000 qualifiers
src_mac=01:02:03:04:05:06/0xffffffffffff,ip_protocol=17/0xff
plexxil#
```

show fsat

Display Fully Specified Affinity Topologies

show history

Display previously entered commands for this session.

show hosts

Display domain and IP hostname lookup settings.

show install

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

show interface

Display interface information. If you do not specify an interface name (IFNAME), then all interfaces are listed.

```
show interface <IFNAME|>
```

show mac hw-table

Display MAC table from forwarding hardware.

show mac sw-table

Display MAC table in software. Optionally you can specify verbose display, a summary or a detailed summary.

```
show mac sw-table [verbose | summary [detail]]
```

show nsm client

Display list of clients of NSM daemon.

show peers

Display peer information.

show process

Display list of running processes.

show psat

Display Partially Specified Affinity Topologies.

show running-config

Display currently operating settings.

show ssh key

Display the current SSH public key data.

show startup-config

Display settings saved in persistent storage.

show system cores

List any existing core files on the system.

show tech-support

Display a large amount of system information for troubleshooting purposes.

```
show tech-support (page|)
```

show users

Display configured user accounts.

start-shell

Enter a basic OS shell.

support log-bundle

Gather system log files into an archived bundle (**log-bundle.tar.gz**) for analysis by Plexxi technical support. By default, gathers logs from past 24 hours. Can optionally specify a number of days or hours prior, or a specific date/time from which to gather.

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

verify FILE

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.

```
verify (md5|sha) FILE (WORD|)
```

Command Reference – CONFIG mode

The CONFIG mode includes all of the commands available in the EXEC and PRIV-EXEC modes plus the following commands:

arp

Set or remove static ARP entry. Optionally, you can indicate a specific interface for this ARP entry.

```
arp A.B.C.D MAC (IFNAME|)
no arp A.B.C.D (IFNAME|)
```

banner motd

Specify a message of the day banner displayed when users connect.

```
banner motd default
banner motd LINE
no banner motd
```

clock protocol

Specify system clock sync protocol as using full NTP or no sync at all.

```
clock protocol (ntp|none)
```

clock timezone

Specify the system timezone setting. Use the command show timezone list to view accepted timezone names.

```
clock timezone WORD
no clock timezone
```

debug

Disable all debugging.

```
no debug all
```

debug nsm

Description:

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 [all|nsm|ha|events|kernel|packet]
no debug nsm [all|nsm|ha|events|kernel|packet]
[no] debug all nsm
[no] debug nsm (all|)
[no] debug nsm events
[no] debug nsm ha
[no] debug nsm ha all
[no] debug nsm kernel
[no] debug nsm packet (recv|send|) (detail|)
```

do LINE

Run a command LINE from PRIV-EXEC mode. This will cause you to leave any sub-mode of 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.

enable password

Specify a password for the `enable` command.

```
enable password (8|) LINE
no enable password
no enable password LINE
```

end | exit | quit | CTRL-D

Leave the current mode and return to the PRIV-EXEC mode.

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.

```
fib retain (forever|time <1-65535>|)
no fib retain (forever|time <1-65535>|)
```

help

Display general help text.

hostname

Specify a hostname. The configured hostname also becomes the command prompt text.

```
hostname (WORD|)
[no] hostname (WORD|)
```

interface

Enter CONFIG-IF mode for interface IFNAME.

```
interface IFNAME
no interface IFNAME
```

ip domain-list

Add a domain to DNS search list.

```
ip domain-list WORD
no ip domain-list WORD
```

ip domain-lookup

Enable/Disable DNS lookups.

```
ip domain-lookup
no ip domain-lookup
```

ip domain-name

Set/Remove primary domain.

```
ip domain-name WORD
no ip domain-name WORD
```

ip forwarding

Enable/Disable IP forwarding.

```
ip forwarding
[no] ip forwarding
```

ip name-server

Add or remove IP address of a DNS server.

```
ip name-server A.B.C.D
no ip name-server A.B.C.D
```

ip route

Add or remove a static IP route.

```
ip route A.B.C.D A.B.C.D (A.B.C.D|INTERFACE)
no ip route A.B.C.D A.B.C.D (A.B.C.D|INTERFACE)
ip route A.B.C.D A.B.C.D (A.B.C.D|INTERFACE) {<1-255>|tag <1-4294967295>|description WORD}
no ip route A.B.C.D A.B.C.D (A.B.C.D|INTERFACE) {<1-255>|tag <1-4294967295>|description WORD}
ip route A.B.C.D/M (A.B.C.D|INTERFACE)
no ip route A.B.C.D/M (A.B.C.D|INTERFACE)
ip route A.B.C.D/M (A.B.C.D|INTERFACE) {<1-255>|tag <1-4294967295>|description WORD}
no ip route A.B.C.D/M (A.B.C.D|INTERFACE) {<1-255>|tag <1-4294967295>|description WORD}
```

ipv6 forwarding

Enable/Disable IPv6 forwarding.

```
ipv6 forwarding
no ipv6 forwarding
```

ipv6 neighbor

Add or remove an IPv6 neighbor.

```
ipv6 neighbor X:X::X:X IFNAME MAC
no ipv6 neighbor X:X::X:X IFNAME
```

ipv6 route

Add or remove a static IPv6 route.

```
ipv6 route X:X::X:X/M (X:X::X:X|INTERFACE)
no ipv6 route X:X::X:X/M (X:X::X:X|INTERFACE)

ipv6 route X:X::X:X/M X:X::X:X INTERFACE
no ipv6 route X:X::X:X/M X:X::X:X INTERFACE

ipv6 route X:X::X:X/M (X:X::X:X|INTERFACE) <1-255>
no ipv6 route X:X::X:X/M (X:X::X:X|INTERFACE) <1-255>

ipv6 route X:X::X:X/M X:X::X:X INTERFACE <1-255>
line console <0-0>
no ipv6 route X:X::X:X/M X:X::X:X INTERFACE <1-255>
```

line console

Enter CONFIG-LINE mode for console.

```
line console <0-0>
```

line vty

Enter CONFIG-LINE mode for vty (telnet and ssh) sessions.

```
line vty <0-871> (<0-871>|)
[no] line vty <0-871> (<0-871>|)
```

log file

Specify settings for system logging.

```
log file FILENAME
[no] log file (|FILENAME)
[no] log record-priority
[no] log stdout
[no] log syslog log trap
(emergencies|alerts|critical|errors|warnings|notifications|informational|debugging)

no log trap
```

max-fib-routes

Set or clear maximum FIB routes.

```
max-fib-routes <1-4294967294>
no max-fib-routes
```

maximum-paths

Set or clear maximum paths.

```
maximum-paths <1-64>
no maximum-paths
```

max-static-routes

Set or clear maximum static routes.

```
max-static-routes <1-4294967294>
no max-static-routes
```

ntp authenticate

Enable/Disable NTP authentication.

```
ntp authenticate
no ntp authenticate
```

ntp authentication-key

Set or clear NTP authentication key.

```
ntp authentication-key <1-4294967295> md5 WORD
no ntp authentication-key <1-4294967295> md5 WORD
```

ntp broadcastdelay

Set or clear NTP broadcast delay.

```
ntp broadcastdelay <1-999999>
no ntp broadcastdelay
```

ntp master

Set or clear NTP master.

```
ntp master (<1-15>|)
no ntp master
```

ntp peer WORD

Add or remove NTP peer entry and settings.

```
ntp peer WORD
ntp peer WORD {prefer|version <1-4>|key <1-4294967295>}
no ntp peer WORD
```

ntp server WORD

Add or remove NTP server entry and settings.

```
ntp server WORD
ntp server WORD {prefer|version <1-4>|key <1-4294967295>}
no ntp server WORD
```

ntp trusted-key

Set or clear NTP trusted key.

```
ntp trusted-key <1-4294967295>
no ntp trusted-key <1-4294967295>
```


router-id

Set or clear router ID.

```
router-id A.B.C.D
no router-id A.B.C.D
```

service advanced-vty

Enable and disable advanced VTY setting.

```
service advanced-vty
no service advanced-vty
```

service password-encryption

Enable and disable password encryption for saved and displayed configuration.

```
service password-encryption
no service password-encryption
```

service terminal-length

Set up the number of lines all future sessions default to.

```
service terminal-length (<0-512>|)
no service terminal-length
```

show cli

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

show list

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

show running-config

Display the currently running settings.

snmp-server community

Configure and remove a community name of up to 32 characters to indicate read-only (ro) access. You can apply an optional defined MIB view to the community. If you want to scope allowed access, you can apply an optional hostname, IP address, or IP subnet designation.

```
snmp-server community NAME [view NAME] ro [allow STRING]
no snmp-server community NAME
```

snmp-server contact

Specify a value for sysContact OID. Use `no` to set to default value `info@plexxi.com`.

```
snmp-server contact STRING
no snmp-server contact
```

snmp-server enable traps

Configure the enable state for sending of various trap types. The default is enabled, use the `no` version of the command to set it to the disabled state.

```
snmp-server enable traps (link|snmp-authentication)
no snmp-server enable traps
```

snmp-server engineID local

Specify a value for the local SNMP agent's engineID rather than letting the agent generate one for itself.

```
snmp-server engineID local WORD
no snmp-server engineID
```

snmp-server group

Define a v3 user access group with null authentication, authentication with no privacy, or fully encrypted privacy. You also can optionally apply a specified View Access Control Model (VACM) MIB view to this group.

```
snmp-server group NAME (noauth|auth|priv) [view NAME] ro
no snmp-server group NAME
```

snmp-server host

Specify a hostname or IP address to receive SNMP traps. You must supply the SNMP version and community name; the UDP port is optional.

```
snmp-server host HOST version (1|2c) NAME [udp-port PORT]
no snmp-server host HOST
```

snmp-server location

Specify value for sysLocation OID. Use the `no` version of the command to set the location to the default value Unknown.

```
snmp-server location STRING
no snmp-server location
```

snmp-server user NAME

Define a SNMP v3 User-Based Security Model (USM) user. You can give the user read-only-access with an optionally applied VACM MIB view or assigned to a group. Authentication and privacy passwords can be optionally configured (though access may be denied without them if the assigned access requires them).

```
snmp-server user NAME [view NAME (noauth|auth|priv)] ro [(encrypted|) auth (md5|sha) WORD
[priv (des|aes) WORD]]
snmp-server user NAME group NAME [(encrypted|) auth (md5|sha) WORD [priv (des|aes) WORD]]
no snmp-server user NAME
```

snmp-server view

Define a named MIB view based on VACM. Issue multiple commands for the same view name to include or exclude more than one OID root. OID can be numeric (dotted-decimal) or well-known text names (such as system or ifTable). The `no` version of the command removes the entire view.

```
snmp-server view NAME OID (included|excluded)
no snmp-server view NAME
```

ssh key

Have the system generate SSH keys of one or more encryption types. If no type is specified, keys are generated for all types. For RSAv1, RSA and ECDSA, a length can be optionally specified in bits. The `force` option replaces any existing key of that type with a new one, without having to first delete the existing key. The `no` form deletes the key of type specified; if no type is given, all keys are deleted.

```
ssh key [dsa|rsa1|rsa|ecdsa] [LENGTH] [force]
no ssh key [dsa|rsa1|rsa|ecdsa]
```

ssh server enable

Enable or disable SSH remote access. The default is enabled.

```
ssh server enable
no ssh server enable
```

telnet server enable

Enable or disable Telnet remote access. The default is enabled.

```
telnet server enable
[no] telnet server enable
```

username

Set up or modify user WORD.

```
username WORD [privilege <0-15>] [password (8|) LINE]
no username WORD
```

Command Reference – CONFIG-IF mode

alias

Specify an alias for this interface.

```
alias WORD
no alias
```

arp-ageing-timeout

Specify ARP aging time in seconds.

```
arp-ageing-timeout <1-3000>
no arp-ageing-timeout
```

description

```
description LINE
no description
```

Specify a textual description for this interface.

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.

help

Display general help text.

ip address

Specify one or more static IP addresses for this interface.

```
ip address A.B.C.D/M (label) LINE
no ip address A.B.C.D/M (label) LINE
ip address A.B.C.D/M (secondary|)
no ip address A.B.C.D/M (secondary|)
ip address A.B.C.D/M (secondary) (label) LINE
no ip address A.B.C.D/M (secondary) (label) LINE
```

ip address dhcp

Specify this interface as a DHCP client.

```
ip address dhcp
no ip address dhcp

ip address dhcp client-id IFNAME
no ip address dhcp client-id IFNAME

ip address dhcp client-id IFNAME hostname WORD
no ip address dhcp client-id IFNAME hostname WORD

ip address dhcp hostname WORD
no ip address dhcp hostname WORD
```

ipv6 address

Specify static IPv6 address for this interface.

```
ipv6 address X:X::X:X/M ipv6 address X:X::X:X/M anycast
no ipv6 address X:X::X:X/M ipv6 address X:X::X:X/M anycast
```

mtu

```
mtu <68-9216>
no mtu
```

Set or clear MTU on this interface.

multicast

Enable/Disable multicast for this interface.

```
multicast
[no] multicast
```

show cli

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

show list

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

show running-config

Display the currently running settings.

shutdown

Disable or enable this interface.

```
shutdown
no shutdown
```

vlan

Add and remove 802.1Q vlan tagged interfaces based from this interface. Accepts single IDs (1-4094) or a comma-separated list. The 'no' form clears all of them from this interface.

```
vlan (add|remove) LIST
no vlan
```

Command Reference – CONFIG-LINE mode

exec-timeout

Specify idle timeout on this line in minutes and/or seconds.

```
exec-timeout (<0-35791>|) (<0-2147483>|)
no exec-timeout
```

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.

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

help

Display general help text.

```
help
```

history max

Specify a maximum size for the command history.

```
history max <0-2147483647>
no history max
```

login

Enable or disable local password checking for this line.

```
login [local]
no login [local]
```

privilege level

Change privilege level for this line.

```
privilege level (<1-15>|)
no privilege level
```

show cli

Display a tree of commands available in this mode.

show list

Display a list of commands available in this mode.

show running-config

Display the currently running settings.