



*Plexxi Switch
Command Line Interface Guide
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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.

Table of Contents

Notices	2
Welcome	10
CLI Modes	10
EXEC	10
Prompt.....	10
Example.....	10
PRIV-EXEC	10
Prompt.....	10
CONFIG	11
Terminology	11
Prompt.....	11
Additional CONFIG Modes.....	11
Exit Commands	11
Save Configuration Changes (Persistent Configuration)	11
Check Current Configuration	12
CLI Help	13
Output Modifiers	14
Repeat a Show Command	14
Login	15
Admin Account	16
Initial Setup	16
Static IP Address	16
Static DNS Settings	16
Point to Controller	16
File Handling	17
Copy, Move, and Delete Examples	17
File Copy with URLs	18
SCP and SFTP	18
HTTP and FTP.....	18
TFTP.....	18
System Date and Time	19
Timezone	19
Set Time and Date Using an NTP Server	20
Keep Time Synchronized Using NTP	20
Update the Software	21
View Currently Running Software Version	21
Display Versions for Aggregated Components	21
View Installations on Internal Partitions	21
Copy Files from Remote Server	22
Install an Update	22
Reload to Complete Installation	23
Configuration Persistence	23

Revert to Previously Running Version	23
SNMP	24
Community Names.....	24
Restrict Community	24
MIB Views	24
SNMP v3 User-Based Security Model.....	25
Groups.....	25
Troubleshooting	26
Switch Log.....	26
Test Network Connectivity	26
Assess System Health.....	27
Display Running Processes.....	27
Hardware Status.....	28
Power Supply Details	28
Temperature Sensor Readings.....	29
Fan Status	29
Working with Plexxi Care Support	30
Combining Output.....	30
Bundling the Log Files.....	31
Specify Number of Days Example	31
Specify a Time Example.....	32
Copying Plexxi Switch Core Files	32
Check for Core Files.....	32
Copy to Another Network Host.....	32
Copy to Local User Disk Space.....	32
Verify Core File in Original Location.....	33
Delete Core Files.....	33
Command Reference – Exec mode	34
clear counters IFNAME.....	34
no debug all.....	34
debug nsm	34
disable	34
enable	34
exit logout quit.....	34
help	34
ping.....	34
show arp.....	35
show cli.....	35
show clock.....	35
show crossbars	35
show debugging nsm	35
show hardware	35
show history	35
show hosts.....	35
show interface.....	35
show interface summary.....	35

show ip arp.....	35
show ip dhcp-relay	35
show ip domain-list.....	36
show ip domain-name	36
show ip igmp snooping	36
show ip interface.....	36
show ip name-server	36
show ip route	36
show ipv6 interface.....	36
show ipv6 neighbors.....	36
show ipv6 route	36
show lacp	37
show lacp lag	37
show lag.....	37
show lag lacp	37
show lag IFNAME vlan	37
show list	37
show lldp.....	37
show lldp local-info.....	37
show lldp neighbor-info	37
show locate-led.....	38
show log	38
show ntp associations	38
show ntp status.....	38
show post.....	38
show privilege.....	38
show qinq svlan.....	38
show qsf.....	38
show ring	38
show router-id	38
show sflow.....	38
show sflow interface	38
show policer config	39
show policer statistics.....	39
show snmp community	39
show snmp engineID.....	39
show snmp group.....	39
show snmp host.....	39
show snmp trap	39
show snmp user.....	39
show snmp view	39
show system resources	39
show system uptime	39
show timezone	39
show topography	40
show transceivers.....	40
show translation tvlan	40
show users.....	40

show version	40
show virtual-routers.....	40
show vlan	40
show vlan group	40
show vlan translation.....	40
ssh	40
telnet	40
terminal length.....	41
terminal monitor	41
traceroute.....	41
Command Reference – PRIV-EXEC mode	42
boot toggle.....	42
clear arp-cache	42
clear controller address	42
clear controller config.....	42
clear cores	42
clear hold	42
clear ip route kernel	42
clear ipv6 neighbors	42
clear ipv6 route kernel	42
clear mac hw-table	42
clear policer statistics	43
clock set.....	43
clock set ntp HOST	43
configure (terminal).....	43
controller set HOST	43
copy FILE.....	43
copy running-config	43
copy startup-config	43
copy URL	43
delete FILE.....	44
delete startup-config	44
dir	44
exit logout quit.....	44
flow create <i>NAME</i>	44
flow delete <i>NAME</i>	47
flow priority <i>NAME</i>	47
hold <i>IFNAME</i>	47
install <FILE>.....	47
lldp port <i>IFNAME</i> receive	47
locate-led	48
move FILE	48
qsfp config	48
reload (rescue)	48
ring confluent-ring-links	48
ring control (in-band out-of-band) [force]	48
ring redirect (for Switch 2e)	49

ring redirect (for Switch 2, 2p, 2sp)	51
show arp.....	52
show boot	52
show controller	52
show debugging snmp.....	52
show file	52
show flow.....	52
show fsat	52
show history	52
show hosts.....	52
show install.....	52
show interface.....	53
show mac hw-table.....	53
show mac sw-table	53
show nsm client.....	53
show peers	53
show process	53
show psat.....	53
show running-config.....	53
show ssh key.....	53
show startup-config	53
show system cores.....	53
show tech-support.....	53
show users.....	54
start-shell	54
support log-bundle.....	54
verify FILE	54
Command Reference – CONFIG mode	55
arp.....	55
banner motd	55
clock protocol.....	55
clock timezone	55
debug.....	55
debug nsm	55
do LINE.....	56
enable password	56
end exit quit CTRL-D	56
fib retain	56
help	56
hostname	56
interface.....	56
ip domain-list	57
ip domain-lookup	57
ip domain-name	57
ip forwarding.....	57
ip name-server.....	57
ip route	57

ipv6 forwarding.....	58
ipv6 neighbor	58
ipv6 route	58
line console	58
line vty	58
log file	58
max-fib-routes	59
maximum-paths	59
max-static-routes.....	59
ntp authenticate	59
ntp authentication-key	59
ntp broadcastdelay.....	59
ntp master	59
ntp peer WORD	60
ntp server WORD	60
ntp trusted-key.....	60
router-id.....	60
service advanced-vty	60
service password-encryption	60
service terminal-length	60
show cli.....	60
show list	61
show running-config.....	61
snmp-server community	61
snmp-server contact.....	61
snmp-server enable traps.....	61
snmp-server engineID local	61
snmp-server group.....	61
snmp-server host	61
snmp-server location	62
snmp-server user NAME.....	62
snmp-server view	62
ssh key	62
ssh server enable	62
telnet server enable.....	62
username	63
Command Reference – CONFIG-IF mode.....	64
alias.....	64
arp-ageing-timeout	64
description	64
end exit quit CTRL-D	64
help	64
ip address	64
ip address dhcp.....	65
ipv6 address	65
mtu.....	65
multicast	65



show cli.....	65
show list.....	65
show running-config.....	65
shutdown.....	66
vlan.....	66
Command Reference – CONFIG-LINE mode	67
exec-timeout.....	67
end exit quit CTRL-D.....	67
help.....	67
history max.....	67
login.....	67
privilege level.....	67
show cli.....	67
show list.....	67
show running-config.....	67

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

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.

- EXEC: basic commands for viewing switch details
- PRIV-EXEC: the basic commands from EXEC plus additional configuration, debug, and cleanup commands
- CONFIG modes: includes the commands from EXEC and PRIV-EXEC modes; however you must prefix those 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`.

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.

Prompt

```
plexxi>
```

Example

The following example shows the EXEC mode command you can use to view the version of software running:

```
plexxi# show version
Plexxi Switch version 2.2.02 r8335 10/30/15 12:11:50
  Copyright (c) 2015 Plexxi, Inc. All rights reserved.
plexxi#
```

PRIV-EXEC

Building on EXEC mode, 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

Prompt

You enter PRIVILEGED EXEC mode from EXEC mode using the `enable` command. The prompt changes to indicate the change in mode.

```
plexxi> enable
plexxi#
```

CONFIG

You enter CONFIG mode to access Plexxi Switch configuration commands. The configuration changes you make in this mode immediately take effect, but are not automatically saved. You need to save the changes in order for them to persist across switch reboots and software upgrades.

Terminology

The name `running-config` refers to the current configuration and `startup-config` refers to the saved configuration

Prompt

```
plexxi# configure
plexxi(config)#
```

Additional CONFIG Modes

CONFIG mode contains additional submodes of configuration:

- CONFIG-IF for managing interfaces
- CONFIG-LINE for managing console and Virtual Terminal (VTY) lines

```
plexxi(config)# interface mgmt
plexxi(config-if)# exit
plexxi(config)# line console 0
plexxi(config-line)# end
plexxi#
```

Exit Commands

After you are finish entering configuration commands, exit CONFIG mode back to PRIV-EXEC mode by typing any of the following:

- CTRL-Z, CTRL-D, quit or exit to move back to the previous mode. For example, if in CONFIG mode you move back to PRIV-EXEC mode. If in either CONFIG mode, you move back to CONFIG
- end puts you back in PRIV-EXEC mode

For example:

```
plexxi(config)# end
plexxi#
```

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:

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

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

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

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**:

```
plexxi# 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
plexxi#
```



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:

```
plexxi> ?
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
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
show        Show command
ssh        Open a SSH connection
telnet     Open a telnet connection
terminal    Set terminal line parameters
traceroute  Trace route to destination
plexxi>
```

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:

```
plexxi> show ?
arp          Internet Protocol (IP)
cli         Show CLI tree of current mode
debugging   Debugging information outputs
hardware    System hardware info
history     Display the session command history
. . .
clock      Display system time and date
port      Display port information
lag       Display link aggregation information
vlan     Display virtual LAN information
path     Display path information
tree     Display tree information
plexxi> show clock ?
| Output modifiers
> Output redirection
<cr>
plexxi> show clock
Fri Oct 30 15:18:23 EDT 2015
plexxi>
```

Output Modifiers

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

```
pas579# show clock ? | Output modifiers > Output redirection <cr>
pas579# 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:

```
plexxi# show interface mgmt | repeat
Repeat every 2s (CTRL-C to stop): show interface mgmt
Interface: mgmt   ifIndex: 4
  Ethernet Hardware Address: e039.d700.0e7f
    Admin: up      Link: up          Oper: up
  Duplex: full    MTU: 1500      Bandwidth: 1g
    Inet: 172.17.202.13/16      Broadcast: 172.17.255.255
    Inet6: fe80::e239:d7ff:fe00:e7f/64
Repeat every 2s (CTRL-C to stop): show interface mgmt
Interface: mgmt   ifIndex: 4
  Ethernet Hardware Address: e039.d700.0e7f
    Admin: up      Link: up          Oper: up
  Duplex: full    MTU: 1500      Bandwidth: 1g
    Inet: 172.17.202.13/16      Broadcast: 172.17.255.255
    Inet6: fe80::e239:d7ff:fe00:e7f/64
Repeat every 2s (CTRL-C to stop): show interface mgmt
Interface: mgmt   ifIndex: 4
  Ethernet Hardware Address: e039.d700.0e7f
    Admin: up      Link: up          Oper: up
  Duplex: full    MTU: 1500      Bandwidth: 1g
    Inet: 172.17.202.13/16      Broadcast: 172.17.255.255
    Inet6: fe80::e239:d7ff:fe00:e7f/64
Repeat every 2s (CTRL-C to stop): show interface mgmt

Interface: mgmt   ifIndex: 4
  Ethernet Hardware Address: e039.d700.0e7f
    Admin: up      Link: up          Oper: up
```



```
Duplex: full      MTU: 1500      Bandwidth: 1g
  Inet: 172.17.202.13/16          Broadcast: 172.17.255.255
  Inet6: fe80::e239:d7ff:fe00:e7f/64
<CTRL-C>
plexxi# show interface mgmt statistics | repeat 5
Repeat every 5s (CTRL-C to stop): show interface mgmt statistics
Interface: mgmt   ifIndex: 4
  InOctets          1355083    OutOctets          29713
  InPkts            9076      OutPkts            248
  InDiscards        3366      OutDiscards        0
  InErrors           0         OutErrors          0
Repeat every 5s (CTRL-C to stop): show interface mgmt statistics
Interface: mgmt   ifIndex: 4
  InOctets          1355872    OutOctets          29713
  InPkts            9084      OutPkts            248
  InDiscards        3368      OutDiscards        0
  InErrors           0         OutErrors          0
Repeat every 5s (CTRL-C to stop): show interface mgmt statistics
Interface: mgmt   ifIndex: 4
  InOctets          1356395    OutOctets          29713
  InPkts            9091      OutPkts            248
  InDiscards        3371      OutDiscards        0
  InErrors           0         OutErrors          0
<CTRL-C>
plexxi#
```

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.

```
plexxi(config)# username admin password $herl0ck
*plexxi(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:

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

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

Point to Controller

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

```
plexxi# controller set 10.10.11.129
plexxi#
```

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:

```
plexxi# dir
User Files:
-----
243264462  Sep 7 2012 17:27  0.3.0
380        Sep 12 2012 10:41  config
434        Oct 3 2012 16:37  test_config
plexxi#
```

- 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

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.

```
plexxi# delete test_config
plexxi# dir
User Files:
-----
243264462  Sep 7 2012 17:27  0.3.0
380        Sep 12 2012 10:41  config
plexxi# move config old_config
plexxi# dir
User Files:
-----
243264462  Sep 7 2012 17:27  0.3.0
380        Sep 12 2012 10:41  old_config
plexxi# copy running-config current_config
plexxi# dir
User Files:
-----
243264462  Sep 7 2012 17:27  0.3.0
```

```

434          Oct 3 2012 16:44    current_config
380          Sep 12 2012 10:41    old_config
plexxi#

```

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:

```

plexxi# copy current_config sftp://joe@my_server/configs/my_switch/oct3_config
Password:
plexxi#
plexxi# copy scp://release_server/releases/1.3.0.tar.gz latest_release
Username: jsmith
Password:
plexxi#

```

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:

```
plexxi# clock set 12:05 3 4 2013
Sun Apr 3 12:05:00 EDT 2013
plexxi#
```

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:

```
plexxi# 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
plexxi#
plexxi# configure
Enter configuration commands, one per line. End with CNTL/Z.
plexxi(config)# clock timezone US/Hawaii
*plexxi(config)# end
*plexxi# show clock
Sun Apr 3 06:13:41 HST 2011
*plexxi#
```

Set Time and Date Using an NTP Server

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

```
*plexxi# clock set ntp pool.ntp.org
 3 Oct 11:20:10 ntpdate[18950]: step time server 64.73.32.134 offset
47451859.499793 sec
*plexxi# show clock
Wed Oct 3 11:20:14 HST 2012
*plexxi#
```

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:

```
*plexxi(config)# clock protocol ntp
*plexxi(config)# ntp server pool.ntp.org prefer
Translating IPv4 address: 50.97.210.169 " " ... OK
*plexxi(config)# end
*plexxi# 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 ]
*plexxi#
*plexxi# 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 Oct 3 2012)
clock offset is 4294967295.998 msec, root delay is 73.103 msec
root dispersion is 0.000 msec,
*plexxi#
```



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:

```
plexxi# show version
Plexxi Switch version 0.3.2 r8095 10/03/12 14:18:29
Copyright (c) 2012 Plexxi, Inc. All rights reserved.
plexxi#
```

Display Versions for Aggregated Components

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

```
pas579# show version detail Plexxi Switch version name-master-master_20131210
12/03/13 15:45:36 Copyright (c) 2013 Plexxi, Inc. All rights
reserved. PlexxiSwitch 2.0.0-a48 PlexxiClient 2.0.0-
a119 PlexxiClientUpgrade 2.0.0-a119 pas579#
PlexxiSwitch 2.0.0-a48
PlexxiClient 2.0.0-a119
PlexxiClientUpgrade
2.0.0-a119
pas579#
```

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.)

```
plexxi# show install
Disk partitions [r-running b-boot default]
    A 0.3.0 r7885 Built: Fri Sep 21 19:07:12 EDT 2012 by: releng
  r b B 0.3.2 r8095 Built: Wed Oct 3 14:13:50 EDT 2012 by: releng
plexxi#
```

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:

```
plexxi# dir
User Files:
-----
 243264462   Oct 7 2012 17:27   0.4.0_release.tar.gz
 434         Oct 3 2012 16:44   current_config
 380         Sep 12 2012 10:41  old_config
plexxi#
```

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:

```
plexxi# install 0.4.0_release.tar.gz
This action will overwrite all data on the alternate storage partition.
perform install? (y/n): y
Validating 0.4.0_release.tar.gz ...
Preparing alternate partition ...
Installing files ...
Version '0.4.0 r8663' successfully installed.
Default boot partition changed to 'A'
plexxi# show install
Disk partitions [r-running b-boot default]
  b  A  0.4.0  r8663  Built: Thu Sep 6 16:46:07 EDT 2012 by: releng
  r  B  0.3.2  r8095  Built: Wed Oct 3 14:13:50 EDT 2012 by: releng
plexxi#
```

You can see version 0.4.0 is successfully installed, but the switch is still running on 0.3.2 for the moment. The indicator for boot default shows that if you reload the switch, it will boot into the new 0.4.0 version. To complete the installation, issue the `reload` command.



Reload to Complete Installation

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

. . . <switch reboots> . . .

plexxi# show install
Disk partitions [r-running b-boot default]
  r b   A  0.4.0  r8663 Built: Thu Oct 6 16:46:07 EDT 2012 by: releng
      B  0.3.2  r8095 Built: Wed Oct 3 14:13:50 EDT 2012 by: releng
plexxi# show version
Plexxi Switch version 0.4.0  r8663 10/06/12 16:18:29
Copyright (c) 2012 Plexxi, Inc. All rights reserved.
plexxi#
```

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:

```
plexxi# boot toggle
Default boot partition changed to 'B'
plexxi# show install
Disk partitions [r-running b-boot default]
  r     A  0.4.0  r8663 Built: Thu Oct 6 16:46:07 EDT 2012 by: releng
      b   B  0.3.2  r8095 Built: Wed Oct 3 14:13:50 EDT 2012 by: releng
plexxi#
```

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:

```
plexxi(config)# snmp-server community general ro
```

```
*plexxi(config)# do show snmp community
```

```
SNMP Community Names:
```

```
Name                Access  Allowed Host/Subnet  MIB View
```

```
-----
```

```
general             ro      (any)
```

```
*plexxi(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.

```
*plexxi(config)# snmp-server community system_only view system rw allow 192.168.1.0/24
```

```
*plexxi(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
```

```
*plexxi(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:

```
*plexxi(config)# snmp-server view system-view system included
```

```
*plexxi(config)# do show snmp view
```

```
View Name                Inclusion                OID
```

```
-----
```

```
system-view              included                system
```



```
*plexxi(config)#
```

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

```
*plexxi(config)# snmp-server view no-system-view 1.3.6.1 included
```

```
*plexxi(config)# snmp-server view no-system-view system excluded
```

```
*plexxi(config)# do show snmp view
```

View Name	Inclusion	OID
no-system-view	included	1.3.6.1
	excluded	system
system-view	included	system

```
*plexxi(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:

```
*plexxi(config)# snmp-server user joe view system-view priv ro auth md5 my-secret
priv aes my-other-secret
```

```
*plexxi(config)# do show snmp user
```

SNMP v3 USM User	Auth	Priv	Access	Level	View
joe	MD5	AES	ro	priv	system-view

```
*plexxi(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.

```
*plexxi(config)# snmp-server group delta auth view no-system-view rw
```

```
*plexxi(config)# do show snmp group
```

Group Name	Access	Security	MIB View
delta	rw	auth	no-system-view

```
*plexxi(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.

```
*plexxi(config)# snmp-server user jake group delta auth sha ucantguessthis
```

```
*plexxi(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
*plexxi(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.

```
plexxi# 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:

```
plexxi# 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
plexxi# 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
plexxi#

```

Assess System Health

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

```

plexxi# 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
plexxi#

```

Display Running Processes

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

```

plexxi# 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.

```

plexxi# 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
plexxi#

```

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.

```
plexxi# show hardware
```

```
Product Data:
```

```
-----
Board Type:                SM2
Board Revision:            1.07
Serial Number:             1211200579
Manufacturer Code:        1
Manufacturing Date:        20MAR2012
Base MAC Address:          e039.d700.0e00
Number of MAC Addresses:   128
System Configuration:      All QSFPs as 4x10Gbps
plexxi#
```

Power Supply Details

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

```
plexxi# 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
plexxi#
```

Temperature Sensor Readings

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

```
plexxi# 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  
plexxi#
```

Fan Status

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

```
plexxi# 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  
plexxi#
```

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:

```
plexxi# show tech-support > support_info.txt
plexxi# dir
User Files:
-----
 243264462      Oct 7 2012 17:27      0.4.0
 434           Oct 3 2012 16:44      current_config
 380           Sep 12 2012 10:41     old_config
 28034         Oct 4 2012 15:07      support_info.txt
plexxi# show file support_info.txt
*** show version detail ***
Plexxi Switch version 0.4.0  r8663 10/03/12 14:18:29
  Copyright (c) 2012 Plexxi, Inc. All rights reserved.
PlexxiSwitch
0.4.32
PlexxiClient
0.4.0-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.

```
plexxi# support log-bundle days 3
Gathering files newer than Sun Jan 20 15:17:19 2013 Written to log-bundle.tar.gz
plexxi# dir
User Files:
-----
    419          Jan 23 2013 14:02   config.txt
275604          Jan 23 2013 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:

```
plexxi# support log-bundle 01:00 25 12 2012
Gathering files newer than Tue Dec 25 01:00:00 2012 Written to log-bundle.tar.gz
plexxi# dir
User Files:
-----
      419          Jan 23 2013 14:02   config.txt
4108450          Jan 23 2013 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:

```
plexxi# show system cores
System Core Files
-----
18358272 Jan 22 2013 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:

```
plexxi# 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:

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

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

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


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

```
plexxi# dir
User Files:
-----
      484          Jan 23 2013 14:02   config.txt
18358272         Jan 22 2013 15:21   keep_this_nsm.core
264629316       Jan 18 2013 09:52   latest.tar.gz
```

Verify Core File in Original Location

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

```
plexxi# show system cores System Core Files:
-----
18358272 Jan 22 2013 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.

```
plexxi# delete core://nsm_1358878580_1644.core
plexxi# 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 crossbars

Display crossbar status and info.

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 tabular summary of interface information.

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 current state of LOC_ID LED on switch front panel. The detail modifier shows port level details.

```
show lldp [detail]
```

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 and hostname specified by WORD (Must be in USER@HOST format.)

```
ssh WORD
```

telnet

Open a TELNET connection to the host specified by WORD. If PORT is not given, the default is 23.

```
telnet WORD
```

```
telnet WORD [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 the host indicated by WORD. If not arguments are given, this is interactive.

```
traceroute
```

```
traceroute [ip|ipv6] WORD
```

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

Remove a local file.

delete startup-config

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

dir

List local files.

exit|logout|quit

Leave the current CLI session.

flow create NAME

Creates a User Defined Topology (UDT) flow. The qualifiers define the type traffic to apply this flow to.

Syntax

```
flow create <flow-name> [ priority <priority-value 1-1000> ] [ ingress-ports <port-id> ] { egress-ports <port-id> | drop | frame-process } [ cir <committed information rate> { cbs <committed burst rate> } ] qualifiers
```

Example

```
plexxi# flow create TestFlow priority 1 egress-ports xp67 cir 3000 cbs 3000
qualifiers "src_mac=01:02:03:04:05:06, ip_protocol=17"
```

Traffic Precedence

Traffic that matches both a UDT, as well as an Affinity Topology calculated by the Fitting Engine, is placed onto the UDT. That traffic is then forwarded at a higher precedence than any other traffic. If there is congestion, it is the last traffic to be dropped. UDTs are given the highest priority in a Plexxi network.

Plexxi evaluates how to forward a packet as follows:

- UDTs first. Traffic receives the highest forwarding priority inside a Plexxi fabric.
- FSATs second.
- PSATs last.

Traffic is dropped in the following order if congestion occurs:

- PSAT first.
- FSAT second.
- UDAT last. Only internal Plexxi control traffic has a higher forwarding priority inside the Plexxi fabric.

Flow Action Syntax

Syntax	Use	Details
<code>priority</code>	For flow priority management. Set a relative priority to the flow	Prioritize the flows in relation to one another, which is important when qualifiers for two different flows overlap. Priority is indicated by a number in the range of 1-1000. Only the flow with the highest priority is processed when there are flows with overlapping qualifiers.
<code>ingress-ports <port-id></code> <code>egress-ports <port-id></code> <port-id> for ingress-ports or egress-ports are in the form similar to <code>xp34</code> and might not always directly correspond to the physical switch port numbering.	Ingress port(s) are part of the qualifiers. Egress port(s) are the ports you redirect traffic to.	Optional. Both the ingress and egress ports are optional. If you do not specify ingress ports, the qualifier is applied to traffic coming on any port. If egress ports are not specified, the forwarding of the matching traffic will follow the normal forwarding rules. Plexxi recommends you use the <code>frame-process</code> option when not including egress ports. egress-ports are usually fabric ports except for the last switch in the path, where the egress ports are access ports. When an egress-port is specified on the last switch in a path, traffic is sent out this port overriding any L2 or L3 forwarding decisions for this traffic. When egress ports are specified, no drop or frame-process actions can be specified.
<code>cir</code>	Committed Information Rate	Optional. Sets the bandwidth limitation for the flow being policed.
<code>cbs</code>	Committed Burst Rate	Optional, but required if <code>cir</code> is specified.
<code>drop</code>	Drop all matching traffic	Optional. When specified, the matching traffic is dropped. No egress ports or frame-process actions can be specified.
<code>frame-process</code>	Deliver packet for normal L2 or L3 packet processing	Optional. When specified, the matching packet is accepted and normal L2 or L3 forwarding is performed. No egress ports or drop action can be specified. Plexxi recommends using <code>frame-process</code> on the egress switch rather than not having a UDT defined for it.

Qualifiers

Qualifiers represent the values of packet header fields in the traffic that belongs to this flow; they define what traffic belongs to this flow. You can combine qualifiers in a comma separated line. Every qualifier can be given a corresponding bitwise mask. All masks (except for IP addresses) are specified in the hex formatted string (for example, 0xffff). You specify the mask after the qualifier value separated by a forward slash (/).

For example:

```
src_mac=01:02:03:04:05:06/0x0000000000ff, src_transport_port=4096/0x0001
```

The following table lists the qualifiers.

Qualifier	Definition	Syntax
dst_mac	Destination MAC address	dst_mac=<colon-separated-mac-addr>[/<6-byte-hexadecimal-bit-mask>]
src_mac	Source MAC address	src_mac=<colon-separated-mac-addr>[/<6-byte-hexadecimal-bit-mask>]
vlan	VLAN	vlan=<integer-vlan-id>[/<2-byte-hexadecimal-bit-mask>]
dst_ip	Destination IP address in prefix/length format	dst_ip=<dotted-decimal-ip-address>[/<integer-mask-length>]
src_ip	Source IP address in prefix/length format	src_ip=<dotted-decimal-ip-address>[/<integer-mask-mask>]
ip_protocol	IP number used in Protocol field of the IPv4 header	ip_protocol=<integer-protocol-id>[/<2-byte-hexadecimal-bit-mask>]
src_transport_port	Source UDP or TCP port	src_transport_port=<integer-port-number>[/<4-byte-hexadecimal-bit-mask>]
dst_transport_port	Destination UDP or TCP port	dst_port=<integer-port-number>[/<4-byte-hexadecimal-bit-mask>]
dscp	Differentiated Services Code Point (DSCP) value	dscp=<integer-id>[/2-byte-hexadecimal-bit-mask]

Traffic on Egress Ports

When using `<egress-ports>` in flow definitions to send traffic:

- that matches the set of defined qualifiers out a specific port; the matched traffic is sent out this port (or ports) unmodified. (VLAN translation and QinQ processing occurs before UDTs are processed.) Plexxi does not change packets from one VLAN to another even if the source and destination VLAN and/or subnet are different.

The action performed by listing `<egress-ports>` is similar to a L2 switching decision; the device receiving these matched packets must be in the same VLAN and/or subnet, (Or be able to accept a packet that has not been modified.)

For example, if you have a UDT that specifies a source IP address in subnet A and a destination address in subnet B, the UDT matches and forwards the packet onto the egress port and out an access port. However, the recipient never accepts the packet because it is not in the correct VLAN and the destination MAC in the packet is that of the default gateway, not the destination device.

- out a port (or ports) included in a LAG or MLAG, all egress ports on this switch that are part of this LAG or MLAG need to be listed,

Multicasting is allowed with UDT, also MLAG is not going to work as seamlessly as this is implying. A UDT to an MLAG requires multicasting. Those packets will be replicated egressing an MLAG.

Without a list of all egress ports, some traffic will not be forwarded onto this LAG or MLAG; this includes the members of the confluent ring that are active. If all members of the confluent ring are active, they are a LAG group. All should be selected as part of the UDT egress port definition.

UDTs can forward traffic onto ports the switch otherwise would not have chosen to (for example, sending VLAN 5 packets out a port with only VLAN 6 defined), the user is required to handle this on the receiving station on their own or the packets will be dropped by the next hop in the network.

flow delete NAME

Delete a user defined topology flow by name.

flow priority NAME

Change the priority of the previously created user defined topology flow.

```
flow priority NAME <1-1000>
```

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. Set the value of egress rate in Mbps; it cannot be more than the line speed.	<1-10000> 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>		

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:

```
plexxi# 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
```

```
plexxi#
```

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.