



**BXOS Software**

## **CLI Users Guide and Command Reference**

*Release 3.0*

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# About This Guide

This preface provides the following guidelines for using the *BXOS CLI Users Guide and Command Reference*:

- Objectives on page xvii
- Audience on page xvii
- Documentation Conventions on page xviii
- List of Technical Publications on page xix
- Obtaining Documentation on page xx
- Documentation Feedback on page xx
- Requesting Support on page xx

## Objectives

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This guide describes how to use the BX operating system (BXOS) command-line interface (CLI) to configure, monitor, and manage the BX 7000 multi-access gateway.



This manual documents the release 3.0 BXOS software. For additional information about the BXOS software—either corrections to or information that might have been omitted from this guide—see the software release notes at <http://www.juniper.net/>

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## Audience

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This guide is designed for network administrators who set up, configure, monitor, or administer the gateway software through the CLI. This guide is intended for the following audience:

- Customers with technical knowledge and experience with networks and network security, the Internet, and Internet routing protocols.
- Network administrators who install, configure, and manage the Internet.

Personnel operating the equipment must be trained and competent; must not conduct themselves in a careless, willfully negligent, or hostile manner; and must abide by the instructions provided in the documentation.

## Documentation Conventions

Table 1 on page xviii defines the notice icons used in this guide.

**Table 1: Notice Icons**




Icon	Meaning	Description
	Information Note	Indicates important features or instructions.
	Caution	Indicates a situation that might result in loss of data or hardware damage.
	Warning	Alerts you to the risk of personal injury or death.

Table 2 on page xviii defines the text and syntax conventions used in this guide.

**Table 2: Text and Syntax Conventions**

Convention	Description	Examples
<b>Bold sans serif typeface</b>	Represents text that you type.	To enter configuration mode, type the configure command: cli@BX7000> <b>configure</b>
Fixed-width typeface	Represents output on the terminal screen.	cli@BX7000> <b>show chassis alarms</b> No alarms currently active
<i>Italic typeface</i>	<ul style="list-style-type: none"> <li>Introduces important new terms.</li> <li>Identifies book names.</li> <li>Identifies RFC and Internet draft titles.</li> </ul>	<ul style="list-style-type: none"> <li>A policy <i>term</i> is a named structure that defines match conditions and actions.</li> <li><i>BXOS CLI Users Guide and Command Reference</i>.</li> <li>RFC 1997, <i>BGP Communities Attribute</i></li> </ul>
<i>Italic sans serif typeface</i>	Represents variables (options for which you substitute a value) in commands or configuration statements.	Configure the gateway as a DHCP relay agent: [edit] cli@BX7000# <b>set dhcp-relay</b> <b>ip-address;</b>
Sans serif typeface	Represents names of configuration statements, commands, files, and directories; IP addresses; configuration hierarchy levels; or labels on gateway components.	<ul style="list-style-type: none"> <li>To configure a stub area, include the <b>stub</b> statement at the [edit protocol ospf area <i>area-id</i>] hierarchy level.</li> <li>The console port is labeled <b>CONSOLE</b>.</li> </ul>
< > (angle brackets)	Enclose optional keywords or variables.	stub <default-metric <i>metric</i> >;
(pipe symbol)	Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity.	[edit interface <i>interface-name</i> ] set loopback (local   remote   none);

Convention	Description	Examples
# (pound sign)	Indicates a comment specified on the same line as the configuration statement to which it applies.	<code>rsvp {# Required for dynamic MPLS only}</code>
[ ] (square brackets)	Identify a level in the configuration hierarchy.	[edit]
Indentation and braces ( { } )	Enclose a keyword and variable at specific hierarchy levels. You can substitute one or more values for the variable.	<pre>protocol {   ospf {     area 1.1.1.1 {       interface ge-1/0/1 {         admin-state enable;       }     }   } }</pre>
;(semicolon)	Identifies a leaf statement at a configuration hierarchy level.0	
gateway	BX 7000 multi-access gateway	

## List of Technical Publications

Table 3 on page xix lists the BX 7000 multi-access gateway manuals.

To configure and operate the BXOS software, you must also use the configuration statements and operational mode commands documented in the *BXOS Configuration Guide* and *BXOS CLI Users Guide and Command Reference*.

**Table 3: BX 7000 Multi-access Gateway Documentation**

Document	Description
<i>BX 7000 Multi-access Gateway Hardware Guide</i>	Provides a detailed hardware description of the gateway. This guide: <ul style="list-style-type: none"> <li>■ Explains how to unpack, install, mount, access, and maintain the gateway.</li> <li>■ Explains the various hardware components such as power supply, chassis, and ports.</li> <li>■ Provides troubleshooting of the hardware-related issues.</li> </ul>
<i>BXOS Configuration Guide</i>	Provides a detailed software description of the BXOS software. This guide: <ul style="list-style-type: none"> <li>■ Explains the configuration statements used to configure various properties of the gateway.</li> <li>■ Describes how to configure the basic system properties, protocols, interfaces, pseudowires, and tunnels.</li> <li>■ Explains statement hierarchies and parameters used in configuration.</li> </ul>
<i>BXOS CLI Users Guide and Command Reference</i>	Provides a detailed description of all the configuration mode and operational mode commands. This guide: <ul style="list-style-type: none"> <li>■ Explains how to start the CLI and the components of the CLI.</li> <li>■ Contains information about the commands used to set the gateway properties (set commands) and the commands used to view the outputs (show commands).</li> </ul>
<i>BX 7000 Multi-access Gateway Getting Started Guide</i>	Provides an overview on installing the gateway. This guide: <ul style="list-style-type: none"> <li>■ Explains how to quickly set up the gateway.</li> <li>■ Contains the basic steps to install the gateway and establish the basic gateway connectivity.</li> </ul>

## Obtaining Documentation

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To obtain the most current version of all Juniper Networks technical documentation, see the products documentation page on the Juniper Networks Web site at <http://www.juniper.net/>.

To order a documentation CD, which contains this guide and other Juniper Networks technical documents, contact your sales representative.

Copies of the Management Information Bases (MIBs) available in a software release are included on the documentation CDs and at <http://www.juniper.net/>.

## Documentation Feedback

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We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. You can send your comments to [techpubs-comments@juniper.net](mailto:techpubs-comments@juniper.net), or fill out the documentation feedback form at <https://www.juniper.net/cgi-bin/docbugreport/>. If you are using e-mail, be sure to include the following information with your comments:

- Document name
- Document part number
- Page number
- Software release version (not required for *Network Operations Guides [NOGs]*)

## Requesting Support

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Technical product support is available through the Juniper Networks Technical Assistance Center (JTAC). If you are a customer with an active J-Care or JNASC support contract, or are covered under warranty, and need postsales technical support, you can access our tools and resources online or open a case with JTAC.

- JTAC policies—For a complete understanding of our JTAC procedures and policies, review the JTAC User Guide located at <http://www.juniper.net/customers/support/downloads/710059.pdf>.
- Product warranties—For product warranty information, visit <http://www.juniper.net/support/warranty/>.
- JTAC Hours of Operation —The JTAC centers have resources available 24 hours a day, 7 days a week, 365 days a year.

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For quick and easy problem resolution, Juniper Networks has designed an online self-service portal called the Customer Support Center (CSC) that provides you with the following features:

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- Search for known bugs: <http://www2.juniper.net/kb/>
- Find product documentation: <http://www.juniper.net/techpubs/>
- Find solutions and answer questions using our Knowledge Base:  
<http://kb.juniper.net/>
- Download the latest versions of software and review release notes:  
<http://www.juniper.net/customers/csc/software/>
- Search technical bulletins for relevant hardware and software notifications:  
<https://www.juniper.net/alerts/>
- Join and participate in the Juniper Networks Community Forum:  
<http://www.juniper.net/company/communities/>
- Open a case online in the CSC Case Management tool:  
<http://www.juniper.net/cm/>

To verify service entitlement by product serial number, use our Serial Number Entitlement (SNE) Tool located at <https://tools.juniper.net/SerialNumberEntitlementSearch/>.

### **Opening a Case with JTAC**

You can open a case with JTAC on the Web or by telephone.

- Use the Case Management tool in the CSC at <http://www.juniper.net/cm/> .
- Call 1-888-314-JTAC (1-888-314-5822 toll-free in the USA, Canada, and Mexico).

For international or direct-dial options in countries without toll-free numbers, visit us at <http://www.juniper.net/support/requesting-support.html>.



## Part 1

# Using the Command-line Interface

- Introducing the CLI on page 3
- Getting Started: A Quick Tour of the CLI on page 7



## Chapter 1

# Introducing the CLI

This chapter provides an overview of the command-line interface (CLI) for the BX operating system (BXOS) software:

- BXOS Software Overview on page 3
- CLI Overview on page 3
- CLI Modes and Command and Statement Hierarchies on page 4

### **BXOS Software Overview**

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The BXOS software loads all the software components through a boot flash. The first sector of the flash contains configuration information, which is used by the processor during the booting. The BXOS image is embedded with a compressed root file system, which includes the standard libraries and executables for basic operation of the BX 7000 multi-access gateway. The configuration and log files are stored in the journal flash file system. In case of system crash, the kernel writes the kernel stack information in the crash dump partition. This crash information is recovered during the next boot for analysis.

### **CLI Overview**

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The BXOS CLI runs on the gateway. The BXOS CLI provides a set of operational commands and configuration statements that you can use to monitor and configure a gateway.

### **Key Features of the CLI**

The hierarchical organization of statements simplifies the CLI usage and provides a regular syntax for all the commands:

- Consistent command names—Commands that provide the same function have similar names, regardless of the software portion on which they are operating. For example, all **show** commands display the software information and statistics, while all **clear** commands erase the system counters.
- List short description of available commands—The CLI provides information about available commands at each level of the hierarchy. To see a list of the available commands along with a short description, type a question mark (?) at any hierarchy level.

- Command completion—At each hierarchy level, command completion for command names (keywords) is available. You can press either the Tab key or the Spacebar to complete a command or an option that you have partially typed. The complete command name appears if partially typed letters begin with a string that uniquely identifies a command. Otherwise, the CLI displays all its possible completions.

## CLI Modes and Command and Statement Hierarchies

The CLI operational commands and configuration statements are organized under two command modes and various hierarchies. The following sections provide you with an overview of the CLI command modes and command and statements hierarchies:

- CLI Command Modes on page 4
- Operational Command Hierarchy on page 5
- Configuration Statement Hierarchy on page 5

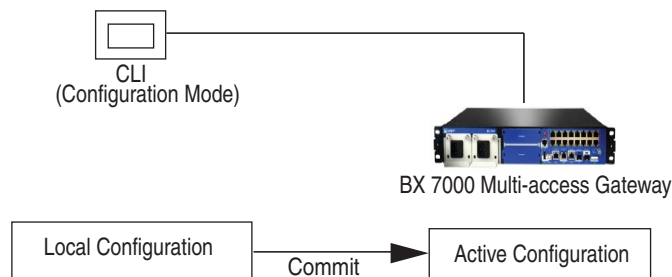
### CLI Command Modes

The BXOS CLI provides various commands for configuring and monitoring the gateway. The CLI provides configuration and status monitoring functionality through SSH through any reachable network. The CLI operates in two different command modes:

- Operational mode—Use this mode to view, monitor, and troubleshoot the BXOS software settings.
- Configuration mode—Use this mode to configure the properties of the BXOS software, including general routing information, routing protocols, user access, interfaces, and other system properties. The configuration is stored as a hierarchy of statements.

In configuration mode, you can view a local file stored in the CLI database. You can alter the running configuration without potentially damaging the current network operations. The gateway does not implement the configuration changes until you commit them using the `commit` command. (See Figure 1 on page 4.)

**Figure 1: Committing a Configuration**



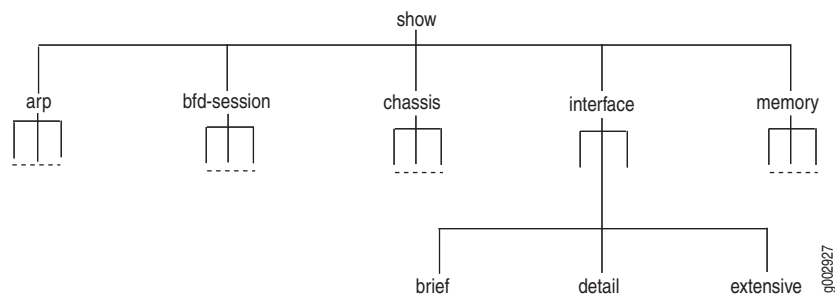
g002925

## Operational Command Hierarchy

The operational commands are organized in a hierarchy. Commands that perform similar functions are grouped together under the same level of hierarchy. For example, the commands displaying information about the configured interfaces are grouped under the `show interface interface-name` command, and the commands displaying OSPF parameters are grouped under the `show ospf` command.

To execute a command, you enter the full command name starting from the top level of a hierarchy. For example, to display a brief view of an interface configured on the gateway, use the `show interface brief` command. (See Figure 2 on page 5.)

**Figure 2: Command Hierarchy Example**



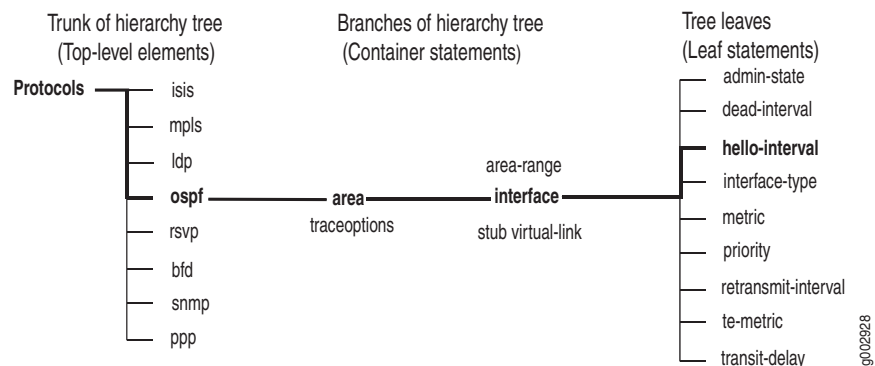
## Configuration Statement Hierarchy

The configuration statement hierarchy contains two types of statements:

- Container statements—These are statements that contain substatements within them.
- Leaf statements—These are standalone statements that do not contain any substatements.

The container and leaf statements together form the configuration hierarchy. (See Figure 3 on page 5.)

**Figure 3: Configuration Statement Hierarchy Example**





## Chapter 2

# Getting Started: A Quick Tour of the CLI

This chapter describes how to start the BX operating system (BXOS) command-line interface (CLI), view the command hierarchy, and edit the BX 7000 multi-access gateway configuration. The detailed information about using the CLI appears in subsequent chapters.

This chapter includes the following topics:

- Before You Start on page 7
- Logging in to the Gateway on page 8
- CLI Elements on page 8
- CLI Messages on page 9
- Types of Commands and Statements on page 10
- Privilege Levels for Using Commands and Statements on page 11
- Switching Between Operational Mode and Configuration Mode on page 11
- Moving Among Hierarchy Levels on page 12
- Getting Help on page 13
- Checking the Status of the Gateway on page 18
- Configuring and Deleting the Protocol Configuration on page 19

### Before You Start

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Ensure that the gateway is properly set up and the BXOS software is installed. To access the BXOS CLI, you should have a direct console connection to the gateway or you can connect the gateway through a remote console with network access using SSH. If the gateway is not set up, follow the installation instructions provided with the gateway before proceeding. For more information, see the *BX 7000 Multi-access Gateway Hardware Guide*.

## Logging in to the Gateway

You can access the gateway using the root account or CLI user privileges.

When the gateway starts, it prompts for a username and password.

- To log in as a root user, type **root** at the system prompt for a username:

```
login as: root
Password: root
```

The root login account has superuser privileges. The root user can invoke the CLI to execute all the commands and statements.

- To log in as a CLI user, access the gateway and type **cli** at the root prompt:

```
root@BX7000> cli
cli@BX7000>
```

The > symbol shows that currently you are in operational mode. When you log in to the gateway and start the CLI, by default you are in operational mode. To enter configuration mode, type **configure** at the command prompt. The command prompt changes to # to show that you are in configuration mode.

## CLI Elements

Figure 4 on page 8 shows the elements of the CLI in operational mode.

**Figure 4: Elements of CLI**

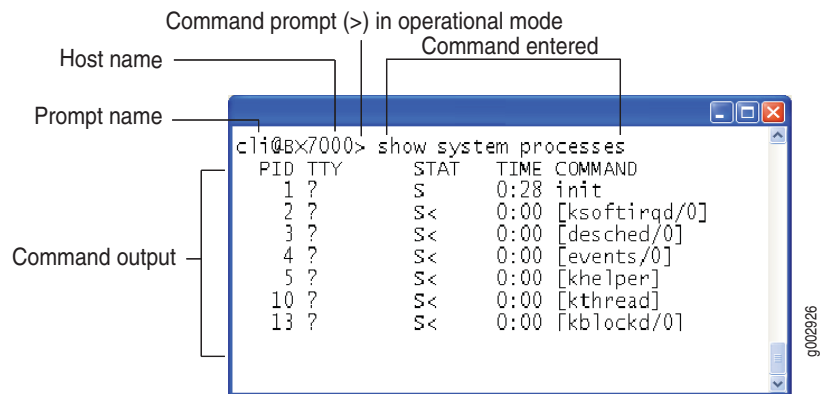


Figure 5 on page 9 shows the elements of the command prompt in configuration mode. When you enter configuration mode using the **configure** command, the command prompt changes from `cli@BX7000>` to `cli@BX7000#` and the CLI displays a list of currently active users. The CLI also displays a banner at the top of the command prompt to show the hierarchy level.

**Figure 5: Command Prompt in Configuration Mode**

```

cli@BX7000> configure
Entering configuration mode

Current CLI Users :
debug
  prompt debug@BX7000 pid 2906 on since Sat Jan 1 00:34:5
debug
  prompt debug@BX7000 pid 2978 on since Sat Jan 1 00:39:0
debug
  prompt debug@BX7000 pid 3023 on since Sat Jan 1 00:41:2
cli
  prompt cli@BX7000 pid 4054 on since Sat Jan 1 04:00:30
root
  prompt root@BX7000 pid 4244 on since Sat Jan 1 04:16:52

[edit]
cli@BX7000#

```

List of currently logged in users

Hierarchy-level banner

Command prompt (#) for configuration mode

Figure 6 on page 9 shows the hierarchy-level banner for a configuration command entered in configuration mode. The hierarchy banner indicates that you are in configuration mode and displays your current location in the statement hierarchy.

**Figure 6: Hierarchy Level Banner**

```

cli@BX7000> configure
Entering configuration mode

Current CLI Users :
debug
  prompt debug@BX7000 pid 2906 on since Sat Jan 1 00:34:5
debug
  prompt debug@BX7000 pid 2978 on since Sat Jan 1 00:39:0
cli
  prompt cli@BX7000 pid 4054 on since Sat Jan 1 04:00:30

[edit]
cli@BX7000# edit protocol ospf

[edit ospf]
cli@BX7000#

```

Banner at the [edit protocol ospf] hierarchy

## CLI Messages

The CLI displays messages for the following events:

- Entering and exiting configuration and operational command modes
- Successful completion of certain commands
- Usage of invalid string or value in a command
- Status messages while committing a command
- Occurrence of errors while working in the CLI

For example, if you type the name of a command or statement that does not exist, the CLI displays the message “Unsupported argument”.

```

cli@BX7000> filefile
Error: Unsupported command 'filefile'

```

```
cli@BX7000> file archive ?
Error: Unsupported argument 'archive'
```

When you commit a configuration, the status message will be displayed.

```
[edit]
cli@BX7000# edit protocol ospf
[edit ospf]
cli@BX7000# set admin-state disable
[edit ospf]
cli@BX7000# up
[edit]
cli@BX7000# commit
Commit in progress...
Commit completed [Elapsed time: 1 seconds 148515 microseconds]
```

## Types of Commands and Statements

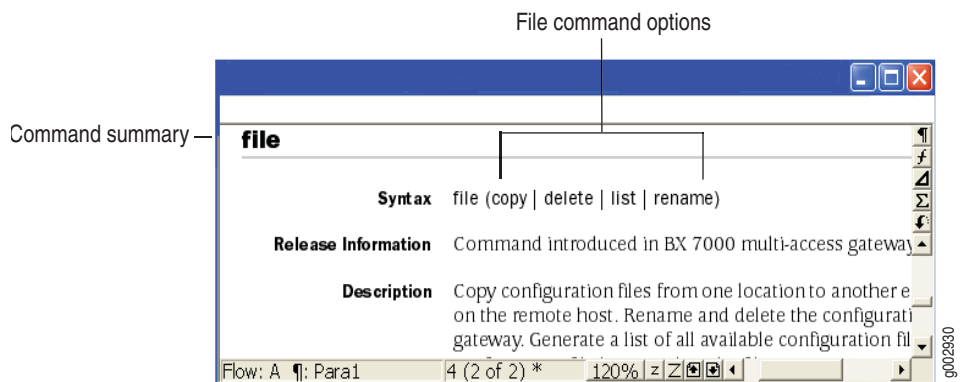
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The CLI supports the following types of commands and statements:

- Operational mode commands—You use the operational mode to enter the commands that monitor the gateway operation. For detailed information, see “Summary of CLI Operational Mode Commands” on page 117.
- Environmental commands—Environmental commands are configuration mode commands that control the CLI environment. For example, you can set a banner on the CLI screen. For detailed information, see “Summary of CLI Environmental Mode Commands” on page 113.
- Configuration mode commands—Configuration mode commands perform general configuration functions; for example, committing a configuration, copying statements, navigating the hierarchy, and managing configuration files.
- Configuration statements—Configuration statements define the gateway configuration. Your location in the configuration hierarchy determines which configuration statements are available. For example, the `[edit interface interface-name]` hierarchy level includes statements to configure the routing interfaces. For more information, see “Configuration Statements and Identifiers” on page 31.

## Command Options

You must follow specific CLI syntax rules while working with the BXOS CLI. Some simple commands require a single word to run, while others require options that you enter to complete the command. Certain commands have options that are not mandatory. These options change how the command is executed and modify the type of command output generated. Figure 7 on page 11 shows an example displaying the options available for the `file` command.

**Figure 7: Command Options**

## Configuration Statements and Identifiers

To configure the properties of the BXOS software, you include relevant statements in the configuration. A statement contains fixed text, called the keyword, and an optional identifier. An identifier is an identifying name, that you define, such as the name of an interface or a username. For example, the **set** command has the following options that you can set:

```
[edit]
cli@BX7000# set ?
cli                CLI settings
date               Date Services
framer-mode       Configure Framer Mode
```

## Privilege Levels for Using Commands and Statements

Each CLI command and configuration statement has an associated privilege level. You can execute, configure, and view only those statements for which you have access privileges. For example, you can use the **configure** command to enter configuration mode only if you have configuration permission. The root login account has superuser privileges with which you can access all the commands and statements.

## Switching Between Operational Mode and Configuration Mode

When you monitor and configure the gateway, you may need to switch between operational and configuration modes. The command prompt changes when you enter configuration mode. The command prompt is a right angle bracket (>) for operational mode and a pound symbol (#) for configuration mode.

When you log in to the gateway, by default you are in operational mode. To enter configuration mode, type the **configure** command at the CLI operational mode prompt:

```
cli@BX7000> configure
Entering the configuration mode
```

```

Current CLI Users :
cli console      -          00:01   1:09m  0.00s  1.05s  -cli
[edit]
cli@BX7000#
    
```

The CLI prompt changes from cli@BX7000> to cli@BX7000# indicating the change in the mode, and a banner displays to indicate the hierarchy level. It also displays a list of other users who are currently working on the CLI. You can use any of the configuration commands in this mode.

To return to operational mode, do either of the following:

- Commit the configuration and exit:

```

[edit]
cli@BX7000# commit
commit complete
[edit]
cli@BX7000# exit
Exiting the configuration mode
cli@BX7000>
    
```

- Exit without committing the configuration:

```

[edit]
cli@BX7000# exit
Exiting the configuration mode without committing (Yes/No) Yes
cli@BX7000>
    
```

When you exit configuration mode, the CLI prompt changes from cli@BX7000# to cli@BX7000> and the banner no longer appears. Your changes are not applied when you quit without committing the configuration. For more information, see “Entering and Exiting the Configuration Mode” on page 32.

## Moving Among Hierarchy Levels

Table 4 on page 12 lists the CLI commands you can use to navigate among the different levels of the configuration statement hierarchy.

**Table 4: CLI Configuration Mode Navigation Commands**

Command	Description
edit hierarchy-level	Moves to an existing configuration statement hierarchy or creates the defined hierarchy and moves to that level.
up	Moves up the hierarchy one level at a time.
top	Moves to the highest level in the hierarchy.

## Getting Help

---

The CLI provides online help. You can get help for commands for which you do not know the complete syntax. The CLI provides the possible completions for partially typed commands. This section includes the following topics:

- Getting Help for Commands on page 13
- Using CLI Command Completion on page 14
- Moving Around and Editing in the CLI on page 15
- Displaying Additional Output on page 15
- Copying Commands into a Text File on page 17
- Using CLI Help on page 17
- Displaying the Command History on page 17

### Getting Help for Commands

To get information about commands at each level of the CLI command hierarchy, do one of the following:

- To view a list of CLI commands and options, type a question mark (?) at the command-line prompt. For example, type a question mark at the command-line prompt to view a list of top-level operational mode commands.

```
cli@BX7000> ?
clear                Clear information in the system
configure            Manipulate software configuration information
exit                Exit from this level
file                Perform file operations
help                Provide help information
history             Show a list of previously run commands
monitor             Monitor Files
ping                Ping remote target
ping-mpls           Ping remote target over mpls
request             Make system-level requests
set                 Set CLI properties
show                Show system configuration
ssh                 Set System SSH Services
traceroute          Trace route to remote host
```

- To view a list of CLI commands and options available for a command, type question mark (?) after that command or command option.

```
cli@BX7000> clear ?
commit              Clear all the config data.
counters            Clear counters entries.
history             Clear CLI Commands History.
isis                Clear ISIS information.
log                 Clear contents of log file.
mpls                Clear mpls information.
ospf                Clear Open Shortest Path First information.
```

- To view a list of all available commands, type `help`.

```
cli@BX7000> help
clear                Clear information in the system
configure           Manipulate software configuration information
exit               Exit from this level
file               Perform file operations
help              Provide help information
history           Show a list of previously run commands
monitor           Monitor Files
ping              Ping remote target
ping-mps         Ping remote target over mpls
request           Make system-level requests
set               Set CLI properties
show              Show system configuration
ssh               Set System SSH Services
traceroute        Trace route to remote host
```

### Using CLI Command Completion

You do not need to type the full command or option name for the CLI to recognize it:

- To display all possible command or option completion, type the partial command followed by a question mark.

```
cli@BX7000> pi?
ping                Ping remote target
ping-mps           Ping remote target over mpls
```

- To complete a command or an option that you have partially typed, press either the Tab or the Spacebar key. If the partially typed letters begin with a string that uniquely identifies a command, the complete command name appears on the CLI.

```
cli@BX7000> s
's' is ambiguous.
Possible completions:
ssh                Connect to remote host
show               Show system configuration
set                Set a parameter
```



**NOTE:** For additional information, see “Using CLI Help” on page 17

## Moving Around and Editing in the CLI

You can use keyboard sequences to edit and view a list of recently executed commands. Table 5 on page 15 lists some of the keyboard shortcuts available in the BXOS software.

**Table 5: CLI Keyboard Sequences**

Category	Action	Keyboard Sequence
Move the Cursor	Move the cursor back one character.	Ctrl + b
	Move the cursor forward one character.	Ctrl + f
	Move the cursor to the beginning of the command line.	Ctrl + a
	Move the cursor to the end of the command line.	Ctrl + e
Delete Characters	Delete the character before the cursor.	Ctrl + h or Delete or Backspace
	Delete all the characters from the cursor to the end of the command line.	Ctrl + k
	Delete all the characters on the command line.	Ctrl + u
	Delete the word before the cursor.	Ctrl + w
Display the previous command line	Scroll backward through the list of recently executed commands.	Ctrl + p
	Scroll forward through the list of recently executed commands.	Ctrl + n
Redraw	Redraw the current line.	Ctrl + l

## Displaying Additional Output

If the output from a command is extensive and goes beyond the length of the screen, the CLI displays the output one page at a time. The `--More--(percentage)` prompt displayed at the bottom of page indicates that more output is available. This format helps you scroll and search through the entire output. You can also use the mouse scrolling button, up arrow, down arrow, and Spacebar keys to navigate through the output.

For example, if you type the `help` command, the `--More--(percentage)` prompt indicates the output percentage covered by the current page. (See Figure 8 on page 16.)

**Figure 8: The --More--(percentage) Prompt**



The --More--(percentage) Prompt—

Figure 8 on page 16 lists the keyboard sequences that you can use at the --More--(percentage) prompt.

**The --More--(percentage) Prompt Keyboard Sequences**

Category	Action	Keyboard Sequence
Get Help	Display information about all keyboard sequences that you can use at the --More--(percentage) prompt.	h
Scroll down	Display next x lines of text, where x is the screen size.	z or Spacebar
	Scroll down one line.	Enter
	Scroll down x lines, where x depends on the current scroll size.	d or Ctrl + D
Skip	Skip forward one line.	s
	Skip forward x lines of text, where x is the screen length.	f
	Skip backwards x screens full of text, where x is the screen length.	b or Ctrl + B
Display line number and filename	Display the current line number.	=
	Display the current filename and line number.	:f
Exit, redraw, and repeat	Quit the output and return to command prompt.	q or Q
	Redraw the screen.	Ctrl + L
	Repeat the previous command.	.
Search	Search through regular expressions, or search for the first occurrence of character.	/ < regular expression >
	Search for the first occurrence of the last entered regular expression.	n
	Go to the place where previous search was initiated.	^

Category	Action	Keyboard Sequence
Execute command	Execute the command in a subshell.	! <code>&lt;cmd&gt;</code> or :! <code>&lt;cmd&gt;</code>
	Start up <code>/usr/bin/vi</code> at the current line.	v
Move to file	Go to next file.	:n
	Go to previous file.	:p

## Copying Commands into a Text File

You can copy the outputs generated by all commands and statements executed on the CLI terminal into a Notepad or Microsoft Word file. To copy the commands, select the text you want to copy, open the destination file, and paste the text.

## Using CLI Help

You can use the CLI help feature to get more information about the commands, their parameters, and usage.

To get information about all commands available in both operational and configuration mode, type the `help` command. The `help` command lists the names and descriptions of all available commands.

```
cli@BX7000# help
Commands available:
clear          Clear information in the system
configure     Manipulate software configuration information
exit          Exit from this level
file          Perform file operations
help          Provide help information
history       Show a list of previously run commands
monitor       Monitor Files
ping          Ping remote target
ping-mps      Ping remote target over mpls
request       Make system-level requests
set           Set CLI properties
show          Show system configuration
ssh           Set System SSH Services
traceroute    Trace route to remote host
```

## Displaying the Command History

You can view a record of all recently executed commands by using the `history` command. This command lists all commands or statements executed in a particular session. For example:

```
cli@BX7000> history
Command history:
0. show version
1. show memory
2. show memory detail
3. show cli prompt
4. show cli
5. history
```



**NOTE:** You can use either the up arrow or down arrow to scroll through the list of recently executed commands directly on the command line.

## Checking the Status of the Gateway

You can also use the `show` command to display the list of command options that can be used to monitor the gateway.

```
cli@BX7000> show ?
arp                Show system Address Resolution Protocol table entries
atm-cross-connect  Show ATM cross connection information
atm-traffic-profiles Show ATM traffic profile information
ba-classifiers     Show Behavioral Aggregate classifier information
bfd-global         Show BFD global parameter
bfd-session        Show Bidirectional Forwarding Detection information
bypass            Show bypass tunnel information
chassis           Show chassis information
cli              Show command-line interface settings
configuration      Show current configuration
date              show system date
exception         Show system exception information
interface         Show interface information
ip               Show IP information
isis             Show Intermediate System-to-Intermediate System
l2circuit        Show Layer 2 circuit information
ldp              Show Label Distribution Protocol information
log              Show contents of log file
manual-mode      Show the manual mode
memory           Show system memory usage information
mf-classifiers    Show Multi-field classifier information
mpls             Show MPLS information
ntp              Show Network Time Protocol information
ospf             Show Open Shortest Path First information
policy           Show routing policy information
ports            Show Ports
protocols        Show routing protocols
qos-profiles     Show QoS profile information
qos-statistics   Show QOS statistics
radius-server    Show RADIUS authentication server information
route            Show routing table information
rsvp             Show Resource Reservation Protocol information
snmp             Show Simple Network Management Protocol information
source-filter    Show MAC filters
statistics       Show statistics for protocol
syslog           Syslog configuration details
system           Show system information
tacplus-server   Show TACACS+ authentication server information
version          Show software process revision levels
zerotouch        Show the zerotouch mode
```

To view the properties under a command option, use `show <command options>`. The following example displays the chassis properties:

```
cli@BX7000> show chassis ?
alarms            Show the chassis alarms
eeprom            Show the syrah eeprom details
environment       Show the chassis power and temperature details
flash             Show the flash details
hardware          Show the syrah hardware details
power             Show the chassis power details
temperature       Show the chassis temperature
```

## Configuring and Deleting the Protocol Configuration

---

You can configure a routing protocol using the `edit` command. You can also use this command to change the configuration of the routing protocol by modifying, deleting, or re-creating the statements. The following examples show how to edit a protocol configuration:

- To edit the dead and hello intervals of the OSPF protocol, enter the hierarchy path of the statements:

```
[edit]
cli@BX7000# edit protocol ospf
[edit ospf]
cli@BX7000# edit area 0.0.0.0
[edit ospf area 0.0.0.0]
cli@BX7000# edit interface ge-1/0/0
[edit ospf area 0.0.0.0 interface ge-1/0/0]
cli@BX7000# set hello-interval 7
[edit ospf area 0.0.0.0 interface ge-1/0/0]
cli@BX7000# set dead-interval 28
[edit ospf area 0.0.0.0 interface ge-1/0/0]
cli@BX7000# top
[edit]
cli@BX7000#
```

- If you do not want to run OSPF on the first interface, you can delete a statement:

```
[edit]
cli@BX7000# edit protocol ospf
[edit ospf]
cli@BX7000# edit area 0.0.0.0
[edit ospf area 0.0.0.0]
cli@BX7000# delete interface ge-1/0/0
[edit ospf area 0.0.0.0]
cli@BX7000# top
[edit]
cli@BX7000#
```

- If you want OSPF to run on an interface with the default values for the hello and dead intervals, delete the existing hello and dead interval timers:

```
[edit ospf area 0.0.0.0 interface ge-1/0/0]
cli@BX7000# delete hello-interval
[edit ospf area 0.0.0.0 interface ge-1/0/0]
cli@BX7000# delete dead-interval
```

- You can set multiple statements that belong to the same hierarchy. This reduces the number of commands you use to set each statement. For example, you can set the hello interval and the dead interval that belong to the same hierarchy level.

Get the original hello and dead interval timers on the interface, and then set the statements:

```
[edit ospf area 0.0.0.0 interface ge-1/0/0]
cli@BX7000# set hello-interval 5
[edit ospf area 0.0.0.0 interface ge-1/0/0]
cli@BX7000# set dead-interval 20
[edit ospf area 0.0.0.0 interface ge-1/0/0]
cli@BX7000# exit
cli@BX7000>
```

## Part 2

# Monitoring and Configuring the BX 7000 Multi-access Gateway

- Using Operational Mode Commands to Monitor the BX 7000 Multi-access Gateway on page 23
- Using Commands and Statements to Configure the BX 7000 Multi-access Gateway on page 29
- Managing Configurations on page 37



## Chapter 3

# Using Operational Mode Commands to Monitor the BX 7000 Multi-access Gateway

Use the BX operating system (BXOS) command-line interface (CLI) operational mode commands to monitor, modify, and troubleshoot the BX 7000 multi-access gateway settings. This chapter includes the following sections, which provide information on the CLI operational commands:

- CLI Operational Mode Commands on page 23
- Using Operational Mode Commands on page 25
- Monitoring Who Uses the CLI on page 26
- Interface Naming Conventions on page 26
- Viewing Files and Directories on page 27

## CLI Operational Mode Commands

---

This section includes the following topics:

- CLI Command Categories on page 23
- Commonly Used Operational Mode Commands on page 24

### CLI Command Categories

A variety of commands are available when you log in to the gateway and launch the CLI. These can be categorized as follows:

- Controlling the CLI environment—These commands configure the banner on the CLI display screen and the CLI hostname. For a detailed description of these commands, see “Summary of CLI Environmental Mode Commands” on page 113.

- **clear**—Clears the CLI screen, log, history, counters, statistics, and protocol database information for the BXOS software.
  - **monitor**—Performs real-time debugging of the various components of the gateway, including the protocols and interfaces.
  - **ping**—Determines the reachability of a remote network host.
  - **show**—Displays the current configuration and information about chassis, interfaces, routing protocols, routing tables, routing policy filters, system processes, system statistics, and system memory.
  - **traceroute**—Traces the route to a remote network host.
- Rebooting and restarting the software—The **request** command performs system-level operations, including stopping and rebooting the gateway and loading the BXOS software images. This command also performs the snapshot operation by copying the current image into backup.
- Connecting to other network systems—The **ssh** command opens the secure shell connections.
- Copying files—The **copy** command copies files from one location to another on the same gateway.
- Entering configuration mode—The **configure** command provides a series of commands to configure the BXOS software and the gateway properties. These commands include ATM and TDM-related services or system services to configure routing protocols, interfaces, and network management features.
- Exiting configuration mode—The **exit** command takes you out of configuration mode.



**NOTE:** For more detailed information about the operational mode commands, see “Summary of CLI Operational Mode Commands” on page 117.

### Commonly Used Operational Mode Commands

Table 6 on page 24 lists some of the operational commands that you can use to monitor the operation of the gateway.

**Table 6: Commonly Used Operational Mode Commands**

Category	Command	Description
Software version	show version	Displays the version of the software running on the gateway.
Remote systems	ping	Determines the host reachability and network connectivity.
	traceroute	Shows the route to a network system.
System memory	show system virtual-memory	Displays the current BXOS memory details.

Category	Command	Description
File manipulation	file list	Displays a list of files and directories on the BX 7000 multi-access gateway.
	file show	Shows the contents of a file.
	file delete	Deletes a file.
Interface information	show interface	Displays detailed information about interfaces.
Chassis	show chassis alarms	Displays chassis alarm status.
	show chassis eeprom	Displays the BX 7000 multi-access gateway eeprom details.
	show chassis environment	Displays gateway environment information.
	show chassis flash	Displays flash details.
	show chassis hardware	Displays hardware inventory.
	show chassis power	Displays chassis power details.
	show chassis temperature	Displays chassis temperature.
Routing table information	show route	Displays information about entries in the routing tables.
IS-IS	show isis adjacency	Displays adjacent gateways.
OSPF	show ospf neighbor	Displays standard information about the OSPF neighbors.
RSVP	show rsvp interface	Shows the status of interfaces on which RSVP is running.
	show rsvp session	Lists currently active RSVP sessions.

## Using Operational Mode Commands

This section includes the following topics, which describe the general features of the CLI operational commands:

- Commands with Brief, Detail, or Extensive Options on page 25
- Controlling the Scope of a Command on page 26

### Commands with Brief, Detail, or Extensive Options

You can control the amount of information displayed in the output of the `show` command using the `brief`, `detail`, or `extensive` option. To list the options available for any command, type `?` after the command. For example:

```
cli@BX7000> show interface ge-1/0/0 ?
brief          Display brief output
detail         Display detailed output
extensive      Display extensive output
```

## Controlling the Scope of a Command

The commands provide options that you can use to identify specific components on the gateway. For example:

To display information about a specific interface, type the interface name as a command option:

```
cli@BX7000> show interface ge-1/0/0
Physical interface :ge-1/0/0, Enabled, Physical Link : Up
Logical interface :ge-1/0/0.0, Interface index:3
Link-level type: Ethernet, MTU: 1500
Speed :100 Mbps,          Interface Operational state is Enabled
Vlan Tagging      : Disabled
Auto negotiation : Enabled , Source filtering : Disabled
Local address : 192.168.1.110  Network address : 192.168.1.0
Prefix length : 24
Physical Address : 00:00:01:02:04:0d
Description :
```

## Monitoring Who Uses the CLI

---

A maximum of four users can simultaneously log in to the gateway and use the CLI to configure or modify the operating system software configuration. When you enter configuration mode and another user is also working, the CLI displays a notification message with the name of the user. SSH shows an error message when the fifth user tries to connect to the gateway.

## Interface Naming Conventions

---

This section describes the following naming conventions used in operational mode:

- Physical Part of an Interface Name on page 26
- Logical Part of an Interface Name on page 27

### Physical Part of an Interface Name

The physical part of an interface name contains the interface type, interface group, a reserved value which is always set to 0, and port number. In the physical part of an interface, a hyphen (-) separates the interface type from the interface group, and a slash (/) separates the interface group, reserved value, and port number.

*type-interface group/0/port*

- The type is the name of the interface. The gateway supports the following interfaces:
  - **ge**—Gigabit Ethernet interface
  - **t1**—T1 interface
  - **e1**—E1 interface

- The interface group specifies a group of interfaces. The gateway supports the following group of interfaces:
  - 0—T1 or E1 interface
  - 1—Gigabit Ethernet interface

The BX 7000 multi-access gateway has 16 T1 or E1 interfaces denoted as t1-0/0/0 through t1-0/0/15 or e1-0/0/0 through e1-0/0/15, three copper Ethernet interfaces denoted as ge-1/0/0 through ge-1/0/2, and two fiber-optic Ethernet interfaces denoted as ge-1/0/1 and ge-1/0/2.

- The second part is always denoted as 0 for the T1, E1, and Gigabit Ethernet interfaces.
- The third part identifies the specific interface within the group. The gateway has 16 T1 or E1 ports (0 through 15), and three copper Ethernet ports (0 through 2).

### Logical Part of an Interface Name

The logical unit part of an interface name corresponds to the logical unit number to be configured on a T1, E1, or Ethernet interface. For the Ethernet interface, the unit number ranges from 0 through 31. For other interfaces that support logical interfaces, the unit number ranges from 0 through 65,534.

A period (.) separates the interface name and the logical unit number. The logical number forms the virtual part of an interface.

**type-interface-group/0/port.logical**

## Viewing Files and Directories

---

The BXOS software stores information in various files, including configuration files, log files, and gateway software files. You use CLI operational mode commands to view files and directories.

This section includes the following topics:

- Listing Files and Directories on page 27
- Specifying Filenames and URLs on page 28

### Listing Files and Directories

To view the directory structure of the BXOS software and the individual files, use the `file` command in operational mode:

- To get help about the `file` command, type `?`:

```
cli@BX7000> file ?
copy          Copy files
delete        Delete files from the system
list          List file information
```

rename	Rename files
show	Show file contents

- To view a list of files located in the home directory, type the `list` command:

```
cli@BX7000> file list
```

The default directory for the `list` command is the home directory of the user logged in to the gateway.

- To view the contents of other files and directories, specify a location:

```
cli@BX7000> file list /config
```




---

**NOTE:** For more information about the file operations, see “file” on page 119 and “Performing CLI File Operations” on page 39.

---

### Specifying Filenames and URLs

Some of the CLI commands, such as `file copy`, `file delete`, `file rename`, and `file show`, require a filename. You can specify a filename or URL to perform these actions.

- *filename*—Refers to a file in the current directory on the local flash drive.
- *path/ filename*—Refers to a file on the local flash disk.

To run a `copy` command, specify the source filename as well as the destination filename:

```
cli@BX7000> file copy source-file target-file
```

To delete a file, you can specify the file path if it is present in the current directory:

```
cli@BX7000> file delete /tmp/a.txt
```

## Chapter 4

# Using Commands and Statements to Configure the BX 7000 Multi-access Gateway

This chapter describes how to use the BX operating system (BXOS) command-line interface (CLI) to configure the BX 7000 multi-access gateway. This chapter contains the following sections:

- CLI Configuration Mode Commands on page 29
- Entering and Exiting the Configuration Mode on page 32
- Modifying the Configuration on page 33

## CLI Configuration Mode Commands

---

You can configure all properties of the BXOS, including interfaces, general routing information, routing protocols, and system hardware. The gateway configuration is stored as a hierarchy of statements. In configuration mode, you can create a specific hierarchy of the configuration statements that you want to use. A set of configuration commands is activated on the gateway only after you commit the configuration commands. You can create the hierarchy interactively or you can create an ASCII text file that is loaded onto the gateway and then commit it.

### Configuration Mode Commands

Table 7 on page 29 lists the configuration mode commands.

**Table 7: Configuration Mode Commands**

Command	Description
commit	Commits the set of configuration changes to the gateway database and activates the configuration on the gateway.
clear	Clears statistics and protocol data information in the gateway.
configure	Enters the configuration mode.
debug	Debugs command.

**Table 7: Configuration Mode Commands**

<b>Command</b>	<b>Description</b>
delete	Deletes a statement or an identifier. This command deletes all subordinate statements and identifiers contained within the specified statement path.
edit	Moves to the specified statement hierarchy. This statement creates the specified hierarchy level if it does not exist.
exit	Exits the current level of the statement hierarchy, returning to the level prior to the last <b>edit</b> command. This command can also be used to exit from configuration mode.
file	Makes a copy of the existing statement in the configuration file.
help	Displays help about the available configuration statements.
history	Displays the list of recently used commands.
load	Loads a set of CLI commands, which are saved in a file.
lock	Locks configuration mode to execute privileged commands and configurations.
monitor	Monitors the files.
ping	Pings a remote target.
ping-mpls	Pings a remote target over MPLS.
request	Makes a system-level request.
restart	Restarts the interface command.
save	Saves a set of CLI commands executed in a session.
set	Creates a statement hierarchy and sets the identifier values. This is similar to the <b>edit</b> command except that your current level in the hierarchy does not change.
show	Displays the current configuration.
ssh	Sets system SSH services.
top	Returns to the top level of configuration command mode, is indicated by the <b>[edit]</b> banner.
traceroute	Traces a route to the remote host.
unlock	Unlocks the configuration mode.
up	Exits the current level of the statement hierarchy, returning to the level prior to the last <b>edit</b> command.

## Configuration Statements and Identifiers

You can configure all gateway properties by including statements in the configuration. A statement consists of a keyword, which is fixed text, and an optional identifier. An identifier is an identifying name that you define, such as the name of an interface, or a username. Table 8 on page 31 shows the top level CLI configuration mode statements.

**Table 8: Configuration Mode Top Level Statements**

Statement	Description
atm-profile	Configures the ATM interface traffic profiles.
chassis	Configures properties of the gateway chassis, such as conditions that activate alarms and concatenation properties.
connection	Configures the cross-connection between two links.
interface	Configures interface information, such as encapsulation, interfaces, virtual channel identifiers (VCIs), and data-link connection identifiers (DLCIs).
policy-options	Defines routing policies that can be used to filter and set properties in incoming and outgoing gateways.
protocol	Configures routing protocols such as IS-IS, LDP, MPLS, OSPF, and RSVP.
rmon	Configures the Remote Monitoring (RMON) details, which enable the network monitor and console systems to exchange network monitoring data.
static-route	Configures the static route details.
syslog	Configures the system log details.
system	Configures system-wide properties, including the hostname, domain name, Domain Name System (DNS) server, user logins and permissions, mappings between hostnames and addresses, and software processes.

## Configuration Statement Hierarchy

The gateway configuration hierarchy statements are structured in a tree form as container and leaf elements. Each statement at the top level of the configuration hierarchy resides at the trunk (or root level) of a hierarchy tree. The top level statements are container statements that include other statements that form the tree branches. The leaf statements are the leaves of the hierarchy tree. An individual hierarchy of statements, which starts at the trunk of the hierarchy tree, is called a statement path.

## Entering and Exiting the Configuration Mode

---

You can configure the BXOS software by entering configuration mode and creating a hierarchy of configuration statements.

To enter configuration mode, use the `configure` command:

```
cli@BX7000> configure
Entering the configuration mode
Current CLI Users :
cli      console -          00:01   1:09m  0.00s  1.05s  -cli

[edit]
cli@BX7000#?
baseline      Baseline IP Configurations
clear         Clear information in the system
commit        Commit current set of changes
configure     Manipulate software configuration information
debug         Debug command
delete        Delete a data element
edit          Edit a sub-element
exit          Exit from this level
file          Perform file operations
help          Provide help information
history       Show a list of previously run commands
load          Load configuration commands from a file to console
lock          Lock the Configuration mode
monitor       Monitor Files
ping          Ping remote target
ping-mps     Ping remote target over mpls
request       Make system-level requests
restart       Restart interface command
save          Save the configuration commands to a file
set           Set CLI properties
show          Show a parameter
ssh           Set System SSH Services
top           Exit to top level of configuration
traceroute   Trace route to remote host
unlock        Unlock the configuration mode
up            Exit one level of configuration
```

If multiple users are accessing configuration mode, the name of all users and the part of the configuration they are viewing or editing is displayed. The BXOS software permits up to four users to use the configuration mode simultaneously. For example:

```
cli@BX7000> configure
Entering configuration mode
Current CLI Users :
cli console - 00:01 6:57 0.00s 0.21s -cli
```

To exit the configuration mode, use the `exit` command:

```
cli@BX7000# exit
exiting configuration mode
cli@BX7000>
```

If you exit from configuration mode using the `exit` command and the configuration changes have not been committed, the CLI displays a warning message.



**NOTE:** For more information, see “Switching Between Operational Mode and Configuration Mode” on page 11.

## Modifying the Configuration

To configure the gateway or modify an existing gateway configuration, add statements to the current configuration. For each statement hierarchy, create the hierarchy starting with a statement at the top level, and continue with the statements that are progressively lower in the hierarchy.

To modify the hierarchy, use the following configuration mode commands:

- `edit`—Use this command to move to a particular hierarchy level. The `edit` command creates the hierarchy, if the hierarchy level does not exist.

```
edit <statement-path>
```

For more detailed information, see “Editing a Configuration” on page 38.

- `set`—Use this command to set the CLI, date, and TDM framer mode properties. You remain at the same level in the hierarchy even after you issue the `set` command.

```
set statement <identifier>
set cli hostname string
```

Where:

- `statement`—The configuration statement itself.
- `identifier`—A string that identifies an instance of a statement.

## Displaying the Current Configuration

To display the current configuration, use the `show` configuration command. This command displays the configuration at the current hierarchy level or at the specified level.

When you display a configuration, a timestamp at the top of the configuration indicates the date and time when the configuration was last changed. For example, to configure an OSPF protocol, use the `edit` command in configuration mode, and to view the configured properties, use the `show` command in configuration mode.

Configure and display a particular hierarchy in the configuration:

```
cli@BX7000# edit protocol ospf

[edit ospf]
cli@BX7000# edit area 1.1.1.1
```

```
[edit ospf area 1.1.1.1]
cli@BX7000# edit interface ge-1/0/1

[edit ospf area 1.1.1.1 interface ge-1/0/1]
cli@BX7000# set admin-state enable

[edit ospf area 1.1.1.1 interface ge-1/0/1]
cli@BX7000# show ospf interface brief
Interface      State          Area           DR ID
BDR ID
ge-1/0/1       BDR           1. 1. 1. 1     11. 11. 11. 2
11. 11. 11. 1
```

### Deleting a Statement from the Configuration

To delete a configuration statement or identifier, use the `delete` configuration mode command. Deleting a statement or an identifier effectively unconfigures the functionality associated with that statement or identifier, returning that functionality to its default condition.

When you delete a statement, the statement and all its subordinate statements and identifiers are deleted from the configuration. For statements with multiple identifiers, an identifier is not automatically deleted unless you manually delete it.

To delete the entire hierarchy starting at the current hierarchy level, do not specify a statement or an identifier in the `delete` command.

- To delete a term for a specified property for the OSPF protocol, use the following CLI commands:

```
cli@BX7000> configure
cli@BX7000# edit protocol ospf
[edit ospf]
cli@BX7000# delete policy-statement policy-name term policy-term-name
[edit ospf]
cli@BX7000# up
cli@BX7000# commit
```

- To unconfigure a particular property, use the following CLI commands:

```
cli@BX7000# edit interface ge-1/0/1
[edit interface ge-1/0/1]
cli@BX7000# set speed 100

[edit interface ge-1/0/1]
cli@BX7000# delete speed
```

---

**NOTE:** For more information, see “Deleting a Configuration” on page 38.

---

### ***Moving Up in the Hierarchy***

You can move to the top level of the hierarchy and a level above the current configuration using the **top** and **up** command respectively:

```
[edit syslog archive]
cli@BX7000# top
[edit]
cli@BX7000#
```

```
[edit syslog archive]
cli@BX7000# up
[edit syslog]
cli@BX7000#
```



## Chapter 5

# Managing Configurations

This chapter describes how to use the BX operating system (BXOS) command-line interface (CLI) to manage the BX 7000 multi-access gateway configurations. This chapter includes the following topics:

- Committing a Configuration on page 37
- Saving and Loading a Configuration File on page 37
- Deleting a Configuration on page 38
- Editing a Configuration on page 38
- Performing CLI File Operations on page 39
- CLI Configuration Input Types on page 40

### Committing a Configuration

---

When you edit a configuration, the CLI maintains a local copy of the configuration. The CLI immediately shows the changes made to the active configuration.

To apply the changes, you use the `commit` command. After committing, the CLI checks the local replica for the proper syntax, activates it, and marks it as the current operational software configuration file.

### Saving and Loading a Configuration File

---

To save a set of CLI commands executed in a session, use the `save commands` configuration mode command. This command saves all the commands that you have committed since logging in to your account.

```
cli@BX7000# save commands filename
```

To load a set of CLI commands from an already saved file, which is located on the gateway, use the `load` configuration mode command:

```
cli@BX7000# load filename
```

## Deleting a Configuration

---

To delete an existing configuration, parameter, or value, use the **delete** configuration mode command:

```
cli@BX7000# delete parameter-name
```

To delete a particular configuration, first delete all the configured parameters set while configuring the feature. The CLI automatically deletes the parameter value when the parameter is deleted.

To delete configured parameters, you must enter the hierarchy using the **edit** command. For example, to delete the TACPLUS server parameters, the commands are as follows:

```
[edit]
cli@BX7000# edit system
[edit system]
cli@BX7000# edit tacplus-server 1.1.1.1
[edit system 1.1.1.1]
cli@BX7000# delete port
[edit system 1.1.1.1]
cli@BX7000# delete secret
[edit system 1.1.1.1]
cli@BX7000# delete timeout
[edit system 1.1.1.1]
cli@BX7000# up
[edit system]
cli@BX7000# up
cli@BX7000# commit
```



**NOTE:** For additional information, see “Deleting a Statement from the Configuration” on page 34.

---

## Editing a Configuration

---

To edit a configuration at any level in the hierarchy, use the **edit** command. You can also use this command to set the new parameters at various levels in the hierarchy.

```
[edit]
cli@BX7000# edit command-name
```

For example:

```
[edit]
cli@BX7000# edit system
[edit system]
cli@BX7000# edit tacplus-server 1.1.1.1
[edit system 1.1.1.1]
cli@BX7000# set port 5
```

The CLI configuration mode provides the following default options after you enter a hierarchy level:

```
cli@BX7000# edit system
[edit system]
cli@BX7000# ?
  delete           Delete a data element
  edit             Edit a sub-element
  exit            Exit from this level
  help            Provide help information
  history          Show a list of previously run commands
  set             Set a system settings parameter
  show            Show system configuration
  top             Exit to top level of configuration
  up             Exit one level of configuration
```

## Performing CLI File Operations

---

The BXOS software supports the following file operations:

- Copying a Configuration File on page 39
- Deleting a Configuration File on page 39
- Renaming a Configuration File on page 39
- Displaying the Configuration File Contents on page 40
- Listing the Configuration Files on page 40

### Copying a Configuration File

You can copy the contents of an existing configuration file into the same file or into a new file, as well as append the contents to an existing configuration file by using the following file configuration mode command:

```
cli@BX7000# file copy source-file target-file
cli@BX7000# file copy /config/startup.cfg /config/backup.cfg
```

### Deleting a Configuration File

You can delete a configuration file by using the following file configuration mode command:

```
cli@BX7000# file delete file-name
cli@BX7000# file delete a.txt
```

### Renaming a Configuration File

You can rename a configuration file by using the following file configuration mode command:

```
cli@BX7000# file rename source-filename target-filename
cli@BX7000# file rename a.txt b.txt
```

## Displaying the Configuration File Contents

You can directly view the contents of a configuration file by using the following file configuration mode command:

```
cli@BX7000# file show file-name
cli@BX7000# file show a.txt
```

## Listing the Configuration Files

You can also view a list of saved configuration files from the current directory by using the following file configuration mode command:

```
cli@BX7000# file list
```



**NOTE:** For more detailed information on how to use the file configuration mode commands, see “file” on page 119.

## CLI Configuration Input Types

The CLI performs type checking to verify the correct format for the data that contains the identifier and values. For example, if you are specifying an IP address in the statement, you must type the address in a valid format. If you specify the address in a wrong format, an error message prompts you to type the required valid format. Table 9 on page 40 lists the data types that the CLI checks.

**Table 9: CLI Configuration Input Types**

Data Type	Format	Examples
Physical interface name included in [edit interface] hierarchy	<i>type-interface group/0/port</i>	Correct: <i>ge-1/0/0</i> Incorrect: <i>ge-1</i>
Interface name with a logical number	<i>type-interface group/0/port.logical unit number</i>	Correct: <i>ge-1/0/0.1</i>
IP address	<i>Oxhex-bytesoctet&lt;.octet&lt;.octet&lt;.octet&gt;&gt;&gt;</i>	Correct: <i>1.2.3.4</i>
IP address (destination prefix) and prefix length	<i>Oxhex-bytes&lt;/length&gt;octet&lt;.octet&lt;.octet&gt;&gt;&gt;&lt;/length&gt;</i>	Correct: <i>1.2.3.4/32</i>
OSPF area identifier (ID)	<i>Oxhex-bytesoctet&lt;.octet&lt;.octet&lt;.octet&gt;&gt;&gt;</i>	Correct: <i>54, 0.0.0.54, 1.2.3.4</i> Sample translations: <i>54</i> becomes <i>0.0.0.54</i> <i>257</i> becomes <i>0.0.1.1</i>

## Part 3

# CLI Command Summaries

- Summary of Show Commands on page 43
- Summary of CLI Environmental Mode Commands on page 113
- Summary of CLI Operational Mode Commands on page 117
- Summary of CLI Configuration Mode Statements on page 127



## Chapter 6

# Summary of Show Commands

This chapter presents the show operational commands available in the BX operating system (BXOS) software. Use the show commands to view information such as configuration details, status, and statistics of interfaces, ports, tunnels, and pseudowires. You can also use the show commands to verify the validity of your configurations and monitor the gateway operation. Commands are listed in alphabetical order.

Table 10 on page 43 summarizes the command-line interface (CLI) show commands.

**Table 10: BXOS Show Commands**

Task	Command
Display ARP properties.	show arp on page 45
Display ATM cross-connection details.	show atm-cross-connect on page 45
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## show arp

**Syntax** show arp

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Display the current state of the Address Resolution Protocol (ARP).

**Additional Information** See the *BXOS Configuration Guide*.

```
cli@BX7000> show arp
Address      HWtype  HWaddress           Flags Mask  Iface
192.168.1.1  ether   00:80:48:B7:B4:DB  C          ge-1-0-0
10.100.65.44 ether   00:13:D3:60:DF:87  C          ge-1-0-0
11.11.11.1   ether   00:00:00:02:00:03  C          ge-1-0-2
10.100.65.62 ether   00:11:D8:05:40:EE  C          ge-1-0-0
```

## show atm-cross-connect

**Syntax** show atm-cross-connect

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Display the details of all the Asynchronous Transfer Mode (ATM) cross-connection. This command connects two or more links through ATM and also displays the IMA cross-connection. To view the details of a particular connection, provide the connection name.

**Additional Information** See the *BXOS Configuration Guide*.

**Output Details** Table 11 on page 46 lists the output fields for the show atm-cross-connect command. The output fields are listed in the order in which they appear.

**Table 11: show atm-cross-connect Output Field Details**

Field Name	Field Description
Connection name	The name of the cross-connection.
End-1-Interface	The starting point of the connection. The connection can be established between either T1 or E1 interfaces.
End-2-Interface	The final point of the connection.

```

show atm-cross-connect cli@BX7000> show atm-cross-connect
Connection Name          End-1-Interface  End-2-Interface
test                    e1-0/0/0.1      e1-0/0/1.1

cli@BX7000# show atm-cross-connect test
Connection Name          End-1-Interface  End-2-Interface
Connection name: test   e1-0/0/0.1      e1-0/0/1.1
                        End1 vpi: 10      End2 vpi: 20
                        End1 vci: 100     End2 vci: 200
    
```

## show atm-traffic-profiles

```

Syntax show atm-traffic-profiles

Release Information Command introduced in BXOS Release 3.0.

Description Display the information about the configured traffic profiles.

Additional Information See the BXOS Configuration Guide.

show atm-traffic-profiles cli@BX7000> show atm-traffic-profiles
Configured atm traffic profiles: 1
cli@BX7000> show atm-traffic-profiles 1
ATM Traffic Profile Name: 1
Tm-ts-mode:cbr
discard-mode:enable
Tag-cells: enable
Peak-rate: 4528
Sustained-rate: 100
Burst-length: 100
statistics:enable
    
```

## show ba-classifiers

```

Syntax show ba-classifiers

Release Information Command introduced in BXOS Release 3.0.

Description Display the behavioral aggregate classifier information.

Additional Information See the BXOS Configuration Guide.
    
```

```

show ba-classifiers cli@BX7000> show ba-classifiers
Interface name: ge-1/0/1
Classifier name: c
DSCP Value: 4
Match Action : forward
Policer name: pp

```

## show bfd-global

---

**Syntax** show bfd-global

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Display the Bidirectional Forwarding Detection (BFD) parameters.

**Additional Information** See the *BXOS Configuration Guide*.

```

show bfd-global cli@BX7000> show bfd-global
Bfd global parameter
-----
Transmit interval(msec) : 2000
Receive interval(msec) : 2000
Multiplier : 3

```

## show bfd-session address

---

**Syntax** show bfd-session address *ip-address*

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Display the failure between two nodes. BFD is a keepalive protocol and runs over an IP or MPLS tunnel.

**Options** *ip-address*—IP address on which the BFD protocol runs.

**Additional Information** See the *BXOS Configuration Guide*.

```

show bfd-session cli@BX7000> show bfd-session address 25.25.25.1
address 25.25.25.1
Address          State      Detect(msec)  Interval(msec)  Multiplier
Interface/Tunnel
-----
25.25.25.1      Up          15000         3000             5
ge-1/0/1
Client ISIS, TX interval(msec) 3000, RX interval(msec) 3000, multiplier 5
Local diagnostic None, Remote diagnostic None
Local min tx interval(msec) 3000, min rx interval(msec) 3000 , multiplier 5
Remote min tx interval(msec) 3000, min rx interval(msec) 3000 , multiplier 5
Local discriminator 1, Remote discriminator 19

Total number of bfd sessions : 1

```

## show bfd-session tunnel-egress

- Syntax** show bfd-session tunnel-egress
- Release Information** Command introduced in BXOS Release 3.0.
- Description** Display the egress tunnel details for a BFD session.
- Additional Information** See the *BXOS Configuration Guide*.

```
cli@BX7000> show bfd-session tunnel-egress
Address          State          Detect(msec)   Interval(msec) Multiplier
Interface/Tunnel
-----
11.1.1.2        Up             22000         5000           3
Client RSVP Tunnel, TX interval(msec) 2000, RX interval(msec) 2000, multiplier 3
Local diagnostic None, Remote diagnostic None
Local min tx interval(msec) 2000, min rx interval(msec) 2000 , multiplier 3
Remote min tx interval(msec) 1000, min rx interval(msec) 5000 , multiplier 11
Local discriminator 2, Remote discriminator 2
Tunnel end point address :11.1.1.1
Tunnel sender address   :11.1.1.2
Tunnel id                :47284
Extended tunnel id      :11.1.1.2
LSP id                   :1

Total number of bfd sessions : 1
```

## show bfd-session tunnel-ingress

- Syntax** show bfd-session tunnel-ingress
- Release Information** Command introduced in BXOS Release 3.0.
- Description** Display the ingress tunnel details for a BFD session.
- Additional Information** See the *BXOS Configuration Guide*.

```
cli@BX7000> show bfd-session tunnel-ingress
Address          State          Detect(msec)   Interval(msec) Multiplier
Interface/Tunnel
-----
11.1.1.2        Up             150           50             5 path1
Client RSVP Tunnel, TX interval(msec) 10, RX interval(msec) 10, multiplier 5
Local diagnostic None, Remote diagnostic None
Local min tx interval(msec) 10, min rx interval(msec) 10 , multiplier 5
Remote min tx interval(msec) 50, min rx interval(msec) 50 , multiplier 3
Local discriminator 1, Remote discriminator 1
Tunnel end point address :11.1.1.2
Tunnel sender address   :11.1.1.1
Tunnel id                :1
Extended tunnel id      :11.1.1.1
LSP id                   :1

Total number of bfd sessions : 1
```

## show bypass tunnel

---

- Syntax** show bypass tunnel *tunnel-name*
- Release Information** Command introduced in BXOS Release 3.0.
- Description** Display the bypass tunnel details.
- Options** *tunnel-name*—Name of the bypass tunnel.
- Additional Information** See the *BXOS Configuration Guide*.
- show bypass tunnel by** cli@BX7000> show bypass tunnel by  
                                   Bypass Tunnel name : by  
                                   Outgoing interface : ge-1/0/2  
                                   Outgoing label : 0  
                                   No of backup running : 1

## show chassis alarms

---

- Syntax** show chassis alarms
- Release Information** Command introduced in BXOS Release 3.0.
- Description** Display the status of the configured alarm, the chassis, and the interface conditions that trigger either a red or yellow alarm. The chassis alarm indicates a failure associated with the gateway. The chassis alarm conditions are not configurable. The alarms can be DS1, Ethernet, and power alarms.
- Additional Information** See the *BXOS Configuration Guide* and the *BX 7000 Multi-access Gateway Hardware Guide*.
- Output Fields** Table 12 on page 49 lists the output fields for the show chassis alarms command. The output fields are listed in the order in which they appear.

**Table 12: show chassis alarms Output Field Details**

Field Name	Field Description
Alarm time	The date and time when the first alarm is recorded.
Class	The severity class of the alarm, which can be minor, major, or other.
Description	Information about the alarm.

```
show chassis alarms cli@BX7000> show chassis alarms

3 alarms are currently active
Alarm time      Class      Description
2000-01-01 00:19:09 UTC Other      t1-0/0 : Loss of Signal
2000-01-01 00:00:34 UTC Major      Pwr - 0 : Power Supply Failed
2000-01-01 00:00:34 UTC Major      Pwr - 0 : Power Supply Removed
```

## show chassis eeprom

- Syntax** show chassis eeprom
- Release Information** Command introduced in BXOS Release 3.0.
- Description** Display the data content in EEPROM.
- Additional Information** See the *BX 7000 Multi-access Gateway Hardware Guide*.
- show chassis eeprom**

```
cli@BX7000> show chassis eeprom
Card description :BX7000 Mobile Backhaul Application
Card revision   :3
Card clei       :DSTCLEIP2D
Card serial     :520-000581-253
Part number     :BX7000BASE-AC
```

## show chassis environment

- Syntax** show chassis environment
- Release Information** Command introduced in BXOS Release 3.0.
- Description** Display the chassis environment details.
- Additional Information** See the *BX 7000 Multi-access Gateway Hardware Guide*.
- Output Fields** Table 13 on page 50 lists the output fields for the show chassis environment command. The output fields are listed in the order in which they appear.

**Table 13: show chassis environment Output Field Details**

Field Name	Field Description
power	The power supply conditions for the two power supplies in the chassis: <ul style="list-style-type: none"> <li>■ power_supply_instance—Shows the power supply instance.</li> <li>■ power_status—Shows the current status of the power supply (ON/OFF) for a power supply instance.</li> </ul>
Temperature	The temperature of the processor. If the system temperature exceeds its permissible value, an alarm is raised. <ul style="list-style-type: none"> <li>■ Temp Instance—Shows one of the two temperature sensors.</li> <li>■ Current Temperature—Shows the temperature, in Celsius.</li> </ul>

```
show chassis environment cli@BX7000> show chassis environment
Power
Card :0 Power_status : OFF
Card :1 Power_status : OFF

Temperature
Card : 0 Current Temperature(in Celcius) : 52
Card : 1 Current Temperature(in Celcius) : 49
```

## show chassis flash

---

- Syntax** show chassis flash
- Release Information** Command introduced in BXOS Release 3.0.
- Description** Display the details for the system flash device driver which can be mapped with the system flash partition.
- Additional Information** See the *BX 7000 Multi-access Gateway Hardware Guide*.

```
cli@BX7000> show chassis flash
Flash Information
-----

Flash Total Size      : 256 MBytes

Partition Type       : Primary - Active
Image name           : bxos-install-3.0B3.2
Image size           : 33 MBytes

Partition Type       : Secondary - Backup
Image name           : No image information found

Partition Type       : SIDX - Bootloader
Image name           : bxboot-install-3.0B3.1
Image size           : 581 KBytes
```

## show chassis hardware

---

- Syntax** show chassis hardware
- Release Information** Command introduced in BXOS Release 3.0.
- Description** Display the BX 7000 multi-access gateway chassis hardware details.
- Additional information** See the *BX 7000 Multi-access Gateway Hardware Guide*.
- Output Fields** Table 14 on page 51 lists the output fields for the `show chassis hardware` command. The output fields are listed in the order in which they appear.

**Table 14: show chassis hardware Output Field Details**

Field Name	Field Description
hw name	The name of the hardware device, such as USB console, USB host controller, interfaces, and power supply.
description	The description for the hardware device.

```
cli@BX7000> show chassis hardware
Hw name      :BX-7000
revision     :03
part no      :BX7000BASE-AC
serial       :520-000581-253
description  :BX7000 Mobile Backhaul Application
```

```

Hw name      :PIC
description  :16x T1/E1

Hw name      :PIC
description  :3x 10/100/1000 Ethernet Ports

Hw name      :USB Console
description  :1x USB Console

Hw name      :USB Host Controller
description  :1x USB Host Controller

Hw name      :Power Supply 0
description  :AC Power Supply

Hw name      :Power Supply 1
description  :Non detected
    
```

## show chassis power

---

- Syntax** show chassis power
- Release Information** Command introduced in BXOS Release 3.0.
- Description** Display the gateway chassis power details.
- Additional information** See the *BX 7000 Multi-access Gateway Hardware Guide*.
- Output Fields** Table 15 on page 52 lists the output fields for the `show chassis power` command. The output fields are listed in the order in which they appear.

**Table 15: show chassis power Output Field Details**

Field Name	Field Description
power	The power supply conditions for the two power supplies in the chassis: <ul style="list-style-type: none"> <li>■ power_supply_instance—Shows the power supply instance.</li> <li>■ power_status—Shows the current status of the power supply (ON/OFF) for a power supply instance.</li> </ul>

```

show chassis power cli@BX7000> show chassis power
Instance :0 Power_status : OFF
Instance :1 Power_status : OFF
    
```

## show chassis temperature

---

- Syntax** show chassis temperature
- Release Information** Command introduced in BXOS Release 3.0.
- Description** Display the gateway chassis temperature, in Celsius.
- Additional Information** See the *BX 7000 Multi-access Gateway Hardware Guide*.

**Output Fields** Table 16 on page 53 lists the output fields for the `show chassis temperature` command. The output fields are listed in the order in which they appear.

**Table 16: show chassis temperature Output Field Details**

Field Name	Field Description
Temperature	The temperature of the processor. If the system temperature exceeds its permissible value, then an alarm is raised. <ul style="list-style-type: none"> <li>■ Temp Instance—Shows one of the two temperature sensors.</li> <li>■ Current Temperature—Shows the temperature, in Celsius.</li> </ul>

```
cli@BX7000> show chassis temperature
Card : 0 Current Temperature(in Celcius) : 52
Card : 1 Current Temperature(in Celcius) : 49
```

## show cli

**Syntax** `show cli`

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Display the current settings of the CLI environment variables. The environment variables include the banner that appears at the top of the command-line prompt and the user login details.

**Additional Information** See the *BXOS Configuration Guide*.

**Output Fields** Table 17 on page 53 lists the output fields for the `show cli` command. The output fields are listed in the order in which they appear.

**Table 17: show cli Output Field Details**

Field Name	Field Description
CLI banner	The banner that appears on the top of the CLI screen.
CLI prompt string	The username for the session.
Current time stamp	The current date and time.
Working directory	The current working directory.

```
cli@BX7000> show cli
CLI Banner          : BX7000 CLI Environment
CLI Prompt string  : root@BX7000
Current Time Stamp : Sat Jan  1 06:40:28 UTC 2000
Working directory  : /home/abc/Work/Dec21/xyzroot
```

## show configuration

---

**Syntax** show configuration

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Display a list of all current configurations of the gateway.

**Output Fields** Contain details about the ATM profiles, interfaces, policy options, protocols, and system settings.

**Additional Information** See the *BXOS Configuration Guide*.

```

show configuration cli@BX7000> show configuration

system {
  framer-mode T1;
  rmon jnxPwTDMPerfCurrentSESS.satop {
    event raise log 2;
  }
  arp {
    add 192.168.2.2 00:00:00:00:22:22;
    add 192.168.3.2 00:00:00:00:11:11;
  }
}
interfaces {
  ge-1/0/0 {
    admin-state enable;
    unit 0 {
      family inet address 10.100.65.246/24;
    }
  }
  ge-1/0/1 {
    admin-state enable;
    unit 0 {
      family inet address 192.168.2.1/24;
    }
  }
  ge-1/0/2 {
    admin-state enable;
    unit 0 {
      family inet address 192.168.3.1/24;
    }
  }
  lo0 {
    admin-state enable;
    unit 0 {
      family inet address 6.6.6.6/32;
    }
  }
}
t1-0/0/0 {
  admin-state enable;
  unit 1 {
    admin-state enable;
    vpi 10;
    vci 100;
  }
}
encapsulation atm;
}
t1-0/0/1 {
  admin-state enable;
}

```

```

        unit 1 {
            admin-state enable;
            vpi 10;
            vci 100;
        }
        encapsulation atm;
    }
    t1-0/0/10 {
        admin-state enable;
        unit 1 {
            admin-state enable;
            vpi 10;
            vci 100;
        }
        encapsulation atm;
    }
    t1-0/0/11 {
        admin-state enable;
        unit 1 {
            admin-state enable;
            vpi 10;
            vci 100;
        }
        encapsulation atm;
    }
    t1-0/0/12 {
        admin-state enable;
        unit 1 {
            admin-state enable;
            vpi 10;
            vci 100;
        }
        encapsulation atm;
    }
    t1-0/0/13 {
        admin-state enable;
        unit 1 {
            admin-state enable;
            vpi 10;
            vci 100;
        }
        encapsulation atm;
    }
    t1-0/0/14 {
        admin-state enable;
    }
    t1-0/0/15 {
        admin-state enable;
        unit 1 {
            admin-state enable;
            vpi 10;
            vci 100;
        }
        encapsulation atm;
    }
}
protocols {
    ospf {
        admin-state enable;
        spf-delay 200;
        area 1.1.1.1 {
            interface lo0 {
                admin-state enable;
            }
        }
    }
}

```

```

        interface ge-1/0/0 {
            admin-state enable;
        }
        interface ge-1/0/1 {
            admin-state enable;
        }
        interface ge-1/0/2 {
            admin-state enable;
        }
    }
}
ldp {
    admin-state enable;
    l2circuit satop {
        admin-state enable;
        neighbor-address 1.1.1.1 {
            tunnel lsp;
            interface t1-0/0/14 {
                payload 192;
                jitter-buffer 3000;
                idle-pattern 255;
                dummy-pattern 255;
                lossy-state-entry 50;
                remote-vc-id 80;
            }
        }
    }
}
rsvp {
    admin-state enable;
}
mpls {
    label-switch-path lsp {
        to-address 2.2.2.1;
        from-address 2.2.2.2;
        primary lsp {
            setup-priority 7;
            reservation-priority 0;
        }
    }
}

static-path-inet tnn1 {
    push 3;
    next-hop-address 192.168.1.2;
    out-interface ge-1/0/0;
    ingress-address 192.168.1.1;
    egress-address 192.168.1.2;
}
static-path-inet tnn2 {
    push 3;
    next-hop-address 192.168.3.2;
    out-interface ge-1/0/2;
    ingress-address 192.168.3.1;
    egress-address 192.168.3.2;
}
interface ge-1/0/0 {
    admin-state enable;
}
interface ge-1/0/1 {
    admin-state enable;
}
}

```

```

interface ge-1/0/2 {
  admin-state enable;
}
static-l2circuit p1 {
  admin-state enable;
  neighbor-address 192.168.1.2 {
    tunnel tnn1;
    interface t1-0/0/0.1 {
      pw-mode 1-to-1-vcc;
      control-word enable;
      sequence-check disable;
      cell-concat 3 timeout 100;
      remote-vc-id 1;
      label in-bound 1000001 out-bound 101;
    }
  }
}
static-l2circuit p2 {
  admin-state enable;
  neighbor-address 192.168.3.2 {
    tunnel tnn2;
    interface t1-0/0/15.1 {
      pw-mode 1-to-1-vcc;
      control-word enable;
      sequence-check disable;
      cell-concat 3 timeout 100;
      remote-vc-id 2;
      label in-bound 1000002 out-bound 102;
    }
  }
}
static-l2circuit static-atm_pw1 {
  admin-state enable;
  neighbor-address 192.168.3.2 {
    tunnel tnn2;
    interface t1-0/0/4.1 {
      pw-mode 1-to-1-vcc;
      control-word enable;
      sequence-check enable;
      sequence-switchover 10;
      cell-concat 10 timeout 100;
      remote-vc-id 4;
      label in-bound 1000014 out-bound 1000015;
    }
  }
}
}
connections {
  interface-switch cxn0 vcc t1-0/0/1.1 t1-0/0/2.1;
  interface-switch cxn1 vcc t1-0/0/3.1 t1-0/0/4.1;
  interface-switch cxn2 vcc t1-0/0/5.1 t1-0/0/6.1;
  interface-switch cxn3 vcc t1-0/0/7.1 t1-0/0/8.1;
  interface-switch cxn4 vcc t1-0/0/9.1 t1-0/0/10.1;
  interface-switch cxn5 vcc t1-0/0/11.1 t1-0/0/12.1;
}

```

## show date

---

- Syntax** show date
- Release Information** Command introduced in BXOS Release 3.0.
- Description** Display the current date and time of the system.
- Additional Information** See the *BXOS Configuration Guide*.

```
cli@BX7000> show date
Sat Jan  1 16:43:02 UTC 2000
```

## show exception

---

- Syntax** show exception
- Release Information** Command introduced in BXOS Release 3.0.
- Description** Display the details for exception commands which include the IP address, saved core, and number of core files.
- Additional Information** See the *BXOS Configuration Guide*.

```
cli@BX7000> show exception
Save core context is set
Maximum number of core files that will be generated : 10
FTP server site : 10.100.65.91
FTP User Name   : root
FTP Password    : root
```

## show interface

---

- Syntax** show interface *interface-name*  
<brief | detail | extensive>
- Release Information** Command introduced in BXOS Release 3.0.
- Description** Display the information about an interface. You can view the interface description using the output parameters. The interface can be TI, EI, Ethernet, GRE, IMA, or MLPPP.
- Options** *interface-name*—Standard information about the specified interface. Following is the list of typical interface names:
  - *t1-interface-group/0/port*—T1 interface.
  - *e1-nterface-group/0/port*—E1 interface.
  - *ge-nterface-group/0/port*—Gigabit Ethernet interface.
  - *ml-ppp*—MLPPP interface.
  - *gr-name*—GRE interface.

- *im-name*—IMA interface.
- *brief | detail | extensive*—(Optional) Display the specified levels of output.

**Additional Information** See the *BXOS Configuration Guide*.

**See Also** The following output sections are available to display the output for a T1 interface:

- `show interface t1-0/0/0` on page 59
- `show interface t1-0/0/0 brief` on page 60
- `show interface t1-0/0/0 detail` on page 60
- `show interface t1-0/0/0 extensive` on page 60

The following output section is available to display the GRE interface:

- `show interface gr-r` on page 62

The following sections are available to display the output for an IMA interface:

- `show interface im-ima1` on page 62
- `show interface im-ima1 brief` on page 62
- `show interface im-ima1 detail` on page 63
- `show interface im-ima1 extensive` on page 65

The following sections are available to display the output for an MLPPP interface:

- `show interface ml-ppp` on page 68
- `show interface ml-ppp brief` on page 68
- `show interface ml-ppp detail` on page 69
- `show interface ml-ppp extensive` on page 71

**Output Fields** Contains the parameters for T1, GRE, IMA, and MLPPP interfaces.

```

show interface cli@BX7000> show interface t1-0/0/0
t1-0/0/0 Physical interface :t1-0/0/0, Enabled, Physical Link : Down
          Interface index:61441
          MTU : 0, Speed :1544000, Loopback: Disabled
          Operational state : Disabled, Encapsulation : ATM
          Encoding : b8zs, Framing : esf, Build-out : 0-132
          Cell scramble : disabled
          Clock source : master
          Description :

          Logical Interface :t1-0/0/0.1, Enabled
          Operational state : Disabled
          VPI : 10, VCI : 100

```

```

show interface t1-0/0/0 brief cli@BX7000> show interface t1-0/0/0 brief
cli@BX7000# show interface t1-0/0/1 brief
Physical interface :t1-0/0/0, Enabled, Physical Link : Down
    Interface index:61441
    MTU : 0, Speed :1544000, Loopback: Disabled
    Operational state : Disabled, Encapsulation : ATM
    Encoding : b8zs, Framing : esf, Build-out : 0-132
    Cell scramble : disabled
    Clock source : master
    Description :

Logical Interface :t1-0/0/0.1, Enabled
    Operational state : Disabled
    VPI : 10, VCI : 100
    
```

```

show interface t1-0/0/0 detail cli@BX7000> show interface t1-0/0/0 detail
Physical interface :t1-0/0/0, Enabled, Physical Link : Up
    Interface index:61441
    MTU : 0, Speed :1544000, Loopback: Disabled
    Operational state : Enabled, Encapsulation : Trans
    Encoding : b8zs, Framing : unframe, Build-out : 0-132
    Clock source : master
    Description :
    Traffic statistics:
T1 media:      Seconds
    ES          0
    SES        0
    
```

```

show interface t1-0/0/0 extensive cli@BX7000> show interface t1-0/0/0 extensive
Physical interface :t1-0/0/0, Enabled, Physical Link is Down
    Interface index:61441
    MTU : 0, Interface Description :
    Interface Operational state is Disabled Interface Encapsulation is ATM
    Traffic statistics:
T1 media:      Seconds
    ES          0
    SES        0
    rx_err_hec:0
    rx_err_addr_mismatch:0
    rx_err_overrun:0
    rx_cells:0
    rx_last_unknown_addr:0
    rx_clp1_cells:0
    rx_gfc_cells:0
    tx_cells:0
    tx_clp1_cells:0
    tx_efci_cells:0
    rx_oam_cells:0
    rx_rm_cells:0
    tx_oam_cells:0
    tx_rm_cells:0
    rx_efci_cells:0
    rx_clp0_cells:0
    tx_clp0_cells:0
    rx_crc_err_cells:0
    rx_unsupported_cells:0
    
```

```

Logical Interface :t1-0/0/0.1,
t1-0/0/0.1 Interface Description:Enabled, Unknown Link Status
  Interface Operational state is Disabled
  Interface VPI is:10
  Interface VCI is:100
  Interface Description:
ATM interface Traffic statistics:
  Rx CLP0 :          0    Tx CLP0 : 0
  Rx CLP1 :          0    Tx CLP1 : 0
  UPC tagged       : 0
  Congest discard: 0
  Tx efcf         : 0
  Tx aal5 frames : 0
  Rx ras timeout  : 0
  EPD fr dropped  : 0
  Timeout         : 0
  CRC errors      : 0
  Rx error underflow : 0
  EPD drop frame count : 0
  UPC non-conform CLP0 : 0
  UPC non-conform CLP1 : 0
  Congest discard CLP0 : 0
  Congest discard CLP1 : 0
  Congest discard devthr flag : 0
  Congest discard classth flag : 0
  OAM Cell Statistics :
  Rx CC cells      : 0
  Rx AIS cells     : 0
  Rx RDI cells     : 0
  Rx E2E RDI cells : 0
  Rx E2E AIS cells : 0
  Rx Loopback cells : 0
  Tx Loopback cells : 0
Logical Interface :t1-0/0/0.2,
t1-0/0/0.2 Interface Description:Enabled, Unknown Link Status
  Interface Operational state is Disabled
  Interface VPI is:10
  Interface VCI is:200
  Interface Description:

  ATM interface Traffic statistics:
  Rx CLP0 :          0    Tx CLP0 : 0
  Rx CLP1 :          0    Tx CLP1 : 0
  UPC tagged       : 0
  Congest discard: 0
  Tx efcf         : 0
  Tx aal5 frames : 0
  Rx ras timeout  : 0
  EPD fr dropped  : 0
  Timeout         : 0
  CRC errors      : 0
  Rx error underflow : 0
  EPD drop frame count : 0
  UPC non-conform CLP0 : 0
  UPC non-conform CLP1 : 0
  Congest discard CLP0 : 0
  Congest discard CLP1 : 0
  Congest discard devthr flag : 0
  Congest discard classth flag : 0
  OAM Cell Statistics :
  Rx CC cells      : 0
  Rx AIS cells     : 0
  Rx RDI cells     : 0

```

```
Rx E2E RDI cells      : 0
Rx E2E AIS cells      : 0
Rx Loopback cells     : 0
Tx Loopback cells     : 0
```

**show interface gr-r** cli@BX7000> **show interface gr-r**

```
GRE Interface Name   : "gr-r" , Enabled
IP address : 8.8.8.8 , Operational status : Enabled
Source address : 5.5.5.5      Destination address : 88.88.1.2
Number of pseudo-wires over this interface : 0
```

**show interface im-ima1** cli@BX7000> **show interface im-ima1**

```
Logical Interface :im-ima1 , Enabled , Operational state : Enabled
Interface Description:
Clock mode: CTC
Symmetry mode: Sym OP + Sym Conf
Minimum Active Member links: 1
Active Tx Member links: 2
Active Rx Member links: 2
Differential Delay : 0
Frame size      : 128
Total Tx Bandwidth  : 3.09 Mbps
Total Rx Bandwidth  : 3.09 Mbps

Physical interface :t1-0/0/0, Enabled, Physical Link : Up
Interface index:61444
MTU : 0, Speed :1544000, Loopback: Disabled
Tx state : Enabled,      Rx state : Enabled,      Encapsulation : ATM-IMA
Framing   : esf,        Build-out : 0-132
Cell scramble : enabled
Clock source : master
Description :
```

```
Physical interface :t1-0/0/1, Enabled, Physical Link : Up
Interface index:61445
MTU : 0, Speed :1544000, Loopback: Disabled
Tx state : Enabled,      Rx state : Enabled,      Encapsulation : ATM-IMA
Framing   : esf,        Build-out : 0-132
Cell scramble : disabled
Clock source : master
Description :
```

**show interface im-ima1** cli@BX7000> **show interface im-ima1 brief**  
**brief**

```
Logical Interface :im-ima1 , Enabled , Operational state : Enabled
Interface Description:
Clock mode: CTC
Symmetry mode: Sym OP + Sym Conf
Minimum Active Member links: 1
Active Tx Member links: 2
Active Rx Member links: 2
Differential Delay : 0
Frame size      : 128
Total Tx Bandwidth  : 3.09 Mbps
Total Rx Bandwidth  : 3.09 Mbps

Physical interface :t1-0/0/0, Enabled, Physical Link : Up
Interface index:61444
MTU : 0, Speed :1544000, Loopback: Disabled
Tx state : Enabled,      Rx state : Enabled,      Encapsulation : ATM-IMA
```

```

Framing      : esf,          Build-out : 0-132
Cell scramble: enabled
Clock source : master
Description :

```

```

Physical interface :t1-0/0/1, Enabled, Physical Link : Up
Interface index:61445
MTU : 0, Speed :1544000, Loopback: Disabled
Tx state : Enabled, Rx state : Enabled, Encapsulation : ATM-IMA
Framing   : esf,          Build-out : 0-132
Cell scramble : disabled
Clock source : master
Description :

```

**show interface im-ima1 detail** cli@BX7000> **show interface im-ima1 detail**

```

Logical Interface :im-ima1 , Enabled , Operational state : Enabled
Interface Description:
Clock mode: CTC
Symmetry mode: Sym OP + Sym Conf
Minimum Active Member links: 1
Active Tx Member links: 2
Active Rx Member links: 2
Differential Delay : 0
Frame size          : 128
Total Tx Bandwidth : 3.09 Mbps
Total Rx Bandwidth : 3.09 Mbps

DPS Specific Group Id : 0
NE IMA Grp ID : 1 FE IMA Grp ID : 1
FE Symmetry: Sym Cfg + Sym Op
FE Frame Size : 128
FE IMA Version: IMA Version 1.1
NE State      : GSM = Operational
FE State      : GSM = Operational

```

```

Physical interface :t1-0/0/0, Enabled, Physical Link : Up
Interface index:61444
MTU : 0, Speed :1544000, Loopback: Disabled
Tx state : Enabled, Rx state : Enabled, Encapsulation : ATM-IMA
Framing : esf,          Build-out : 0-132
Cell scramble: enabled
Clock source : master
Description :

```

```

Traffic statistics:
T1 media:          Seconds

```

```

rx_icp_cells:3540
rx_err_icp_cells:0
rx_lods:0
rx_oif:0
rx_icp_violations:0
rx_stuff:204
rx_ne_ses:9
rx_ne_uas:7
rx_ne_uus:17
rx_ne_failure:2
rx_fe_defects:4
rx_fe_failure:0
rx_fe_uus:0
rx_fe_ses:4
rx_fe_uas:0

```

```

tx_icp_cells:4004
tx_stuff:250
tx_ne_uus:0
tx_fe_uus:0
tx_fe_failure:0
tx_ne_failure:0
lif_persistence_in:2500
lif_persistence_out:10000
lods_persistence_in:2500
lods_persistence_out:10000
rfi_persistence_in:2500
rfi_persistence_out:10000
g_id1:0
ne_ima_id:1
fe_ima_id:1
ne_lid:0
fe_lid:0
line_state:0
test_pat_state:TP Disabled
rx_test_pat:255
tx_icp_offset:0
ne_rx_lsm:active
ne_tx_lsm:active
fe_rx_lsm:active
fe_tx_lsm:active
ne_alarm_state:No Alarm
ne_alarm_type:
fe_alarm_state:No Alarm
fe_alarm_type:FE Rx Unusable
delay:0
ES          6
SES         6
    
```

```

Physical interface :t1-0/0/1, Enabled, Physical Link : Up
Interface index:61445
MTU : 0, Speed :1544000, Loopback: Disabled
Tx state : Enabled, Rx state : Enabled, Encapsulation : ATM-IMA
Framing : esf, Build-out : 0-132
Cell scramble : disabled
Clock source : master
Description :
Traffic statistics:
T1 media: Seconds
    
```

```

rx_icp_cells:3226
rx_err_icp_cells:0
rx_lods:0
rx_oif:0
rx_icp_violations:0
rx_stuff:203
rx_ne_ses:0
rx_ne_uas:0
rx_ne_uus:0
rx_ne_failure:0
rx_fe_defects:2
rx_fe_failure:0
rx_fe_uus:0
rx_fe_ses:2
rx_fe_uas:0
tx_icp_cells:3233
tx_stuff:202
tx_ne_uus:0
tx_fe_uus:0
    
```

```

tx_fe_failure:0
tx_ne_failure:0
lif_persistence_in:2500
lif_persistence_out:10000
lods_persistence_in:2500
lods_persistence_out:10000
rfi_persistence_in:2500
rfi_persistence_out:10000
g_id1:0
ne_ima_id:1
fe_ima_id:1
ne_lid:1
fe_lid:1
line_state:0
test_pat_state:TP Disabled
rx_test_pat:255
tx_icp_offset:64
ne_rx_lsm:active
ne_tx_lsm:active
fe_rx_lsm:active
fe_tx_lsm:active
ne_alarm_state:No Alarm
ne_alarm_type:
fe_alarm_state:No Alarm
fe_alarm_type:FE Rx Unusable
delay:0
ES          0
SES         0

```

**show interface im-ima1 extensive** cli@BX7000> **show interface im-ima1 extensive**

```

Logical Interface :im-ima1 , Enabled , Operational state : Enabled
Interface Description:
Clock mode: CTC
Symmetry mode: Sym OP + Sym Conf
Minimum Active Member links: 1
Active Tx Member links: 2
Active Rx Member links: 2
Differential Delay : 0
Frame size          : 128
Total Tx Bandwidth : 3.09 Mbps
Total Rx Bandwidth : 3.09 Mbps

DPS Specific Group Id : 0
NE IMA Grp ID : 1 FE IMA Grp ID : 1
FE Symmetry: Sym Cfg + Sym Op
FE Frame Size : 128
FE IMA Version: IMA Version 1.1
NE State      : GSM = Operational
FE State      : GSM = Operational

Long Port: 0          Short Port: 4
Delay Delta : 1
Rx TP      : 255
Tx TP      : 255
Expecting TP : 255
Running Seconds : 0
Unavailable Seconds: 0
NE TRL LID : 0 FE TRL LID : 0
NE Failure : 0 FE Failure : 0
Ports that have Active Tx LSMs: 0

```

Ports that have Active Rx LSMs: 2

Port Number 0  
 Port Number 1

```

Physical interface :t1-0/0/0, Enabled, Physical Link : Up
Interface index:61444
MTU : 0, Speed :1544000, Loopback: Disabled
Tx state : Enabled, Rx state : Enabled, Encapsulation : ATM-IMA
Framing : esf, Build-out : 0-132
Cell scramble : enabled
Clock source : master
Description :
Traffic statistics:
T1 media:          Seconds
ES                 6
SES                6

rx_icp_cells:4368
rx_err_icp_cells:0
rx_lods:0
rx_oif:0
rx_icp_violations:0
rx_stuff:256
rx_ne_ses:9
rx_ne_uas:7
rx_ne_uus:17
rx_ne_failure:2
rx_fe_defects:4
rx_fe_failure:0
rx_fe_uus:0
rx_fe_ses:4
rx_fe_uas:0
tx_icp_cells:4831
tx_stuff:301
tx_ne_uus:0
tx_fe_uus:0
tx_fe_failure:0
tx_ne_failure:0
lif_persistence_in:2500
lif_persistence_out:10000
lods_persistence_in:2500
lods_persistence_out:10000
rfi_persistence_in:2500
rfi_persistence_out:10000
g_id1:0
ne_ima_id:1
fe_ima_id:1
ne_lid:0
fe_lid:0
line_state:0
test_pat_state:TP Disabled
rx_test_pat:255
tx_icp_offset:0
ne_rx_lsm:active
ne_tx_lsm:active
fe_rx_lsm:active
fe_tx_lsm:active
ne_alarm_state:No Alarm
ne_alarm_type:
fe_alarm_state:No Alarm
fe_alarm_type:FE Rx Unusable
delay:0
    
```

```

Physical interface :t1-0/0/1, Enabled, Physical Link : Up
Interface index:61445
MTU : 0, Speed :1544000, Loopback: Disabled
Tx state : Enabled,      Rx state : Enabled,      Encapsulation : ATM-IMA
Framing   : esf,        Build-out : 0-132
Cell scramble   : disabled
Clock source : master
Description :
Traffic statistics:
T1 media:      Seconds
ES              0
SES            0

rx_icp_cells:4054
rx_err_icp_cells:0
rx_lods:0
rx_oif:0
rx_icp_violations:0
rx_stuff:255
rx_ne_ses:0
rx_ne_uas:0
rx_ne_uus:0
rx_ne_failure:0
rx_fe_defects:2
rx_fe_failure:0
rx_fe_uus:0
rx_fe_ses:2
rx_fe_uas:0
tx_icp_cells:4061
tx_stuff:253
tx_ne_uus:0
tx_fe_uus:0
tx_fe_failure:0
tx_ne_failure:0
lif_persistence_in:2500
lif_persistence_out:10000
lods_persistence_in:2500
lods_persistence_out:10000
rfi_persistence_in:2500
rfi_persistence_out:10000
g_id1:0
ne_ima_id:1
fe_ima_id:1
ne_lid:1
fe_lid:1
line_state:0
test_pat_state:TP Disabled
rx_test_pat:255
tx_icp_offset:64
ne_rx_lsm:active
ne_tx_lsm:active
fe_rx_lsm:active
fe_tx_lsm:active
ne_alarm_state:No Alarm
ne_alarm_type:
fe_alarm_state:No Alarm
fe_alarm_type:FE Rx Unusable
delay:0

```

**show interface ml-ppp** cli@BX7000> **show interface ml-ppp**

```

Interface Name : ml-ppp , Enabled,          Interface Operational state : Enabled

Interface LCP Operational state is Enabled
Interface IP state is Enabled
Interface Local address : 76.76.1.1
Network address : 76.76.1.2
Prefix Length      : 24
MTU                : 1500          Speed : 3.09 Mbps
Short Sequence     : 0            MRRU  : 1500
Minimum Active Member links : 1
Active Member links : 2
Fragment Threshold : 0
Description        :
    
```

```

Physical interface :t1-0/0/0.1, Enabled,          Interface index:13486592
MTU: 1500
Interface Operational state is Enabled
Interface Local address: 0.0.0.0          Network address: 0.0.0.0
Interface Speed   : 1544000
MLPPP Bundle name : ml-ppp
Idle Timeout :0
Keepalive       :10
Negotiate_address :0
lcp_restart_timer :3
ncp_restart_timer :3
compression     :0
Interface LCP Operational state is Enabled
Interface IP state is Enabled
Interface Description :
    
```

```

Physical interface :t1-0/0/1.1, Enabled,          Interface index:13486593
MTU: 1500
Interface Operational state is Enabled
Interface Local address: 0.0.0.0          Network address: 0.0.0.0
Interface Speed   : 1544000
MLPPP Bundle name : ml-ppp
Idle Timeout :0
Keepalive       :10
Negotiate_address :0
lcp_restart_timer :3
ncp_restart_timer :3
compression     :0
Interface LCP Operational state is Enabled
Interface IP state is Enabled
Interface Description :
    
```

**show interface ml-ppp brief** cli@BX7000> **show interface ml-ppp brief**

```

Interface Name : ml-ppp , Enabled,          Interface Operational state : Enabled

Interface LCP Operational state is Enabled
Interface IP state is Enabled
Interface Local address : 76.76.1.1
Network address : 76.76.1.2
Prefix Length      : 24
MTU                : 1500          Speed : 3.09 Mbps
Short Sequence     : 0            MRRU  : 1500
Minimum Active Member links : 1
    
```

```

Active Member links : 2
Fragment Threshold : 0
Description          :

```

```

Physical interface :t1-0/0/0.1, Enabled,      Interface index:13486592
MTU: 1500
Interface Operational state is Enabled
Interface Local address: 0.0.0.0           Network address: 0.0.0.0
Interface Speed   : 1544000
MLPPP Bundle name : ml-ppp
Idle Timeout     :0
Keepalive        :10
Negotiate_address :0
lcp_restart_timer :3
ncp_restart_timer :3
compression      :0
Interface LCP Operational state is Enabled
Interface IP state is Enabled
Interface Description :

```

```

Physical interface :t1-0/0/1.1, Enabled,      Interface index:13486593
MTU: 1500
Interface Operational state is Enabled
Interface Local address: 0.0.0.0           Network address: 0.0.0.0
Interface Speed   : 1544000
MLPPP Bundle name : ml-ppp
Idle Timeout     :0
Keepalive        :10
Negotiate_address :0
lcp_restart_timer :3
ncp_restart_timer :3
compression      :0
Interface LCP Operational state is Enabled
Interface IP state is Enabled
Interface Description :

```

```

show interface ml-ppp cli@BX7000> show interface ml-ppp detail
detail

```

```

Interface Name : ml-ppp , Enabled,      Interface Operational state : Enabled

```

```

Interface LCP Operational state is Enabled
Interface IP state is Enabled
Interface Local address : 76.76.1.1
Network address : 76.76.1.2
Prefix Length       : 24
MTU                  : 1500           Speed : 3.09 Mbps
Short Sequence      : 0             MRRU  : 1500
Minimum Active Member links : 1
Active Member links : 2
Fragment Threshold  : 0
Description         :

```

```

Bundle Statistics:
Rx Frames           : 0
Rx Packets          : 0
Rx MRRU Error       : 0
Rx Inter-Working MRRU Error : 0
Rx Buffer Overrun Error : 0
Tx Frames(Control + Data packets): 0
Tx MRRU error       : 0
Rx Flushed Fragments : 0

```

```

Rx Last Proc Sequence      : 16777215
Tx Last Sequence sent     : 0
Rx Interworking Free Buffer Pointer Error : 0
    
```

```

Physical interface :t1-0/0/0.1, Enabled,      Interface index:13486592
MTU: 1500
Interface Operational state is Enabled
Interface Local address: 0.0.0.0      Network address: 0.0.0.0
Interface Speed   : 1544000
MLPPP Bundle name : ml-ppp
Idle Timeout     :0
Keepalive        :10
Negotiate_address :0
lcp_restart_timer :3
ncp_restart_timer :3
compression      :0
Interface LCP Operational state is Enabled
Interface IP state is Enabled
Interface Description :
    
```

```

PPP Statistics
Tx Frames(Including Packets) : 18      Rx Frames : 17
Tx Bytes : 292 Rx Bytes : 266
Max SDU Errors
Tx : 0 Rx : 0
Non octet error : 0
Rx Packets      : 0
Rx CRC          : 64
Rx Error Bytes : 90
Rx Aborted frames: 1
Rx Buffer overrun: 56
Rx over-run     : 0
Rx HDLC Error  : 0
Rx IW MRU Error : 0
Rx IW Parse Error: 0
Member Link Type : Primary
Tx Fragments    : 0
Tx Fillers sent : 0
Rx Fragments    : 0
Rx Fillers sent : 0
Rx Fragments Overrun : 0
Rx Error Fragments : 0
    
```

```

Physical interface :t1-0/0/1.1, Enabled,      Interface index:13486593
MTU: 1500
Interface Operational state is Enabled
Interface Local address: 0.0.0.0      Network address: 0.0.0.0
Interface Speed   : 1544000
MLPPP Bundle name : ml-ppp
Idle Timeout     :0
Keepalive        :10
Negotiate_address :0
lcp_restart_timer :3
ncp_restart_timer :3
compression      :0
Interface LCP Operational state is Enabled
Interface IP state is Enabled
Interface Description :
    
```

```

PPP Statistics
Tx Frames(Including Packets) : 15      Rx Frames : 15
Tx Bytes : 248 Rx Bytes : 248
Max SDU Errors
    
```

```

Tx : 0 Rx : 0
Non octet error : 0
Rx Packets      : 0
Rx CRC         : 18
Rx Error Bytes  : 18
Rx Aborted frames: 0
Rx Buffer overrun: 0
Rx over-run    : 0
Rx HDLC Error  : 0
Rx IW MRU Error : 0
Rx IW Parse Error: 0
Member Link Type : Member
Tx Fragments   : 0
Tx Fillers sent : 0
Rx Fragments   : 0
Rx Fillers sent : 0
Rx Fragments Overrun : 0
Rx Error Fragments : 0

```

```

show interface ml-ppp extensive cli@BX7000> show interface ml-ppp extensive
Interface Name : ml-ppp , Enabled,      Interface Operational state : Enabled

Interface LCP Operational state is Enabled
Interface IP state is Enabled
Interface Local address : 76.76.1.1
Network address : 76.76.1.2
Prefix Length      : 24
MTU                : 1500      Speed : 3.09 Mbps
Short Sequence     : 0        MRRU : 1500
Minimum Active Member links : 1
Active Member links : 2
Fragment Threshold : 0
Description        :

Bundle Statistics:
Rx Frames          : 0
Rx Packets         : 0
Rx MRRU Error      : 0
Rx Inter-Working MRRU Error : 0
Rx Buffer Overrun Error : 0
Tx Frames(Control + Data packets): 0
Tx MRRU error      : 0
Rx Flushed Fragments : 0
Rx Last Proc Sequence : 16777215
Tx Last Sequence sent : 0
Rx Interworking Free Buffer Pointer Error : 0

Physical interface :t1-0/0/0.1, Enabled,      Interface index:13486592
MTU: 1500
Interface Operational state is Enabled
Interface Local address: 0.0.0.0      Network address: 0.0.0.0
Interface Speed : 1544000
MLPPP Bundle name : ml-ppp
Idle Timeout :0
Keepalive :10
Negotiate_address :0
lcp_restart_timer :3
ncp_restart_timer :3
compression :0
Interface LCP Operational state is Enabled
Interface IP state is Enabled
Interface Description :

```

```

PPP Statistics
Tx Frames(Including Packets) : 30      Rx Frames : 29
Tx Bytes : 460 Rx Bytes : 434
Max SDU Errors
Tx : 0 Rx : 0
Non octet error : 0
Rx Packets      : 0
Rx CRC          : 64
Rx Error Bytes  : 90
Rx Aborted frames: 1
Rx Buffer overrun: 56
Rx over-run     : 0
Rx HDLC Error   : 0
Rx IW MRU Error : 0
Rx IW Parse Error: 0
Member Link Type : Primary
Tx Fragments    : 0
Tx Fillers sent : 0
Rx Fragments    : 0
Rx Fillers sent : 0
Rx Fragments Overrun : 0
Rx Error Fragments : 0
    
```

```

Physical interface :t1-0/0/1.1, Enabled,      Interface index:13486593
MTU: 1500
Interface Operational state is Enabled
Interface Local address: 0.0.0.0      Network address: 0.0.0.0
Interface Speed : 1544000
MLPPP Bundle name : ml-ppp
Idle Timeout :0
Keepalive :10
Negotiate_address :0
lcp_restart_timer :3
ncp_restart_timer :3
compression :0
Interface LCP Operational state is Enabled
Interface IP state is Enabled
Interface Description :
    
```

```

PPP Statistics
Tx Frames(Including Packets) : 25      Rx Frames : 25
Tx Bytes : 388 Rx Bytes : 388
Max SDU Errors
Tx : 0 Rx : 0
Non octet error : 0
Rx Packets      : 0
Rx CRC          : 18
Rx Error Bytes  : 18
Rx Aborted frames: 0
Rx Buffer overrun: 0
Rx over-run     : 0
Rx HDLC Error   : 0
Rx IW MRU Error : 0
Rx IW Parse Error: 0
Member Link Type : Member
Tx Fragments    : 0
Tx Fillers sent : 0
Rx Fragments    : 0
Rx Fillers sent : 0
Rx Fragments Overrun : 0
Rx Error Fragments : 0
    
```

## show ip tcp statistics

---

<b>Syntax</b>	show ip tcp statistics
<b>Release Information</b>	Command introduced in BXOS Release 3.0.
<b>Description</b>	Display the IP TCP statistics.
<b>Additional Information</b>	See the <i>BXOS Configuration Guide</i> .
<b>Output Fields</b>	Contain the connection, segments, and packet details.
<b>show ip tcp statistics</b>	<pre>cli@BX7000&gt; show ip tcp statistics 1322 active connections openings 1166 passive connection openings 66 failed connection attempts 0 connection resets received 30 connections established 64853507 segments received 121457487 segments send out 22430 segments retransmitted 0 bad segments received. 1222 resets sent TcpExt: 32 ICMP packets dropped because they were out-of-window ArpFilter: 0 1272 TCP sockets finished time wait in fast timer 51 packets rejects in established connections because of timestamp 108585 delayed acks sent 6190 delayed acks further delayed because of locked socket Quick ack mode was activated 187571 times 3692 packets directly queued to rcvmsg prequeue. 6 packets directly received from backlog 3651909 packets directly received from prequeue 2488531 packets header predicted 2691 packets header predicted and directly queued to user TCPPureAcks: 56708280 TCPHPAcks: 4380791 TCPRenoRecovery: 0 TCPSackRecovery: 4859 TCPSACKReneging: 0 TCPFACKReorder: 0 TCPSACKReorder: 0 TCPRenoReorder: 0 TCPTSReorder: 0 TCPFullUndo: 0 TCPPartialUndo: 0 TCPDSACKUndo: 0 TCPLossUndo: 0 TCPLoss: 6590 TCPLostRetransmit: 136 TCPRenoFailures: 0 TCPSackFailures: 13 TCPLossFailures: 0 TCPFastRetrans: 18898 TCPForwardRetrans: 3064 TCPSlowStartRetrans: 185 TCPTimeouts: 113 TCPRenoRecoveryFail: 0 TCPSackRecoveryFail: 83 TCPSchedulerFailed: 0</pre>

```

TCPRecvCollapsed: 0
TCPDSACKOldSent: 188334
TCPDSACKOfSent: 1057
TCPDSACKRecv: 185
TCPDSACKOfRecv: 0
TCPAbortOnSyn: 0
TCPAbortOnData: 2
TCPAbortOnClose: 2
TCPAbortOnMemory: 0
TCPAbortOnTimeout: 14
TCPAbortOnLinger: 0
TCPAbortFailed: 0
TCPMemoryPressures: 0
    
```

## show ip traffic

- Syntax** show ip traffic
- Release Information** Command introduced in BXOS Release 3.0.
- Description** Display the IP, Internet Message Control Protocol (ICMP), User Datagram Protocol (UDP), and Transmission Control Protocol (TCP) statistics.
- Additional Information** See the *BXOS Configuration Guide*.
- Output Fields** Table 18 on page 74 lists the output fields for the **show ip traffic** command. The output fields are listed in the order in which they appear.

**Table 18: show ip traffic Output Field Details**

Field Name	Field Description
ip	The IP details, including the number of incoming packets received, discarded, and delivered.
icmp	The traffic details for the Internet Message Control Protocol (ICMP).
Tcp	The traffic details for the Transmission Control Protocol (TCP).
Udp	The packet details for the User Datagram Protocol (UDP).

```

show ip traffic cli@BX7000> show ip traffic
Ip:
 65145090 total packets received
 0 forwarded
 1294 incoming packets discarded
 65133632 incoming packets delivered
 121465867 requests sent out
 374 dropped because of missing route
Icmp:
 1566 ICMP messages received
 0 input ICMP message failed.
ICMP input histogram:
  destination unreachable: 79
  timeout in transit: 34
  redirects: 20
  echo requests: 1207
  echo replies: 226
 1424 ICMP messages sent
 0 ICMP messages failed
    
```

```

ICMP output histogram:
  destination unreachable: 217
  echo replies: 1207
Tcp:
  1322 active connections openings
  1166 passive connection openings
  66 failed connection attempts
  0 connection resets received
  30 connections established
  64853428 segments received
  121457426 segments send out
  22430 segments retransmitted
  0 bad segments received.
  1222 resets sent
Udp:
  3269 packets received
  217 packets to unknown port received.
  1294 packet receive errors
  3686 packets sent
TcpExt:
  233 delayed acks sent
  19 packets directly queued to recvmsg prequeue.
  8 of bytes directly received from prequeue
  2786 packet headers predicted
  4852 acknowledgments not containing data received
  4735 predicted acknowledgments
  0 TCP data loss events
  10 other TCP timeouts
  10 DSACKs sent for old packets
  1 connections aborted due to timeout
IPv4 statistics:
  Total received Packets : 157473 pps
  Host term IPv4 Packets : 157473 pps
  Host term Ipv4 Option Packets : 0 pps
  Host term OSPF Packets : 0 pps
  Received ARP Packets : 15164 pps
  Protocol Error : 0
  Checksum Error : 0
  Forwarded packets : 0

```

## show ip udp statistics

---

**Syntax** show ip udp statistics

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Display the IP UDP statistics.

**Additional Information** See the *BXOS Configuration Guide*.

**show ip udp statistics** cli@BX7000> show ip udp statistics  
Udp:  
 3269 packets received  
 217 packets to unknown port received.  
 1294 packet receive errors  
 3686 packets sent

## show isis adjacency

---

<b>Syntax</b>	show isis adjacency
<b>Release Information</b>	Command introduced in BXOS Release 3.0.
<b>Description</b>	Display the details for IS-IS parameters, including the information about the IS-IS adjacency.
<b>Additional Information</b>	See the <i>BXOS Configuration Guide</i> .
<b>Output Fields</b>	Contain the details about interface level, state, lifetime, priority, last transition, and circuit type.
<b>show isis adjacency</b>	<pre>cli@BX7000&gt; show isis adjacency 7777.8888.9999 9999.8888.7777   Interface: ge-1/0/2, Level: 1, State: Up, Expires: 194 secs   Priority: 1, Last transition: 00:26:01 ago   Circuit type: 3   IP addresses: 44.44.44.2 9999.8888.7777   Interface: ge-1/0/2, Level: 2, State: Up, Expires: 19 secs   Priority: 64, Last transition: 00:31:12 ago   Circuit type: 3   IP addresses: 44.44.44.2</pre>

## show isis database

---

<b>Syntax</b>	show isis database
<b>Release Information</b>	Command introduced in BXOS Release 3.0.
<b>Description</b>	Display the details for IS-IS database parameters.
<b>Additional Information</b>	See the <i>BXOS Configuration Guide</i> .
<b>Output Fields</b>	Contain the details about interface level, including sequence number, checksum, and lifetime period of the packet.
<b>show isis database</b>	<pre>cli@BX7000&gt; show isis database IS-IS level 1 link-state database:   2222.3333.4444.0-0 Sequence: 0x3, Checksum: 0x12c7, Lifetime: 592 secs  IS-IS level 1 link-state database:   2222.3333.4444.0-0 Sequence: 0x4, Checksum: 0x12c7, Lifetime: 432 secs  IS-IS level 1 link-state database:   2222.3333.4444.0-0 Sequence: 0x2, Checksum: 0x12c7, Lifetime: 722 secs  IS-IS level 1 link-state database:   2222.3333.4444.0-0 Sequence: 0x5, Checksum: 0x12c7, Lifetime: 986 secs  IS-IS level 1 link-state database:   2222.3333.4444.0-0 Sequence: 0x2, Checksum: 0x12c7, Lifetime: 794 secs</pre>

## show isis hostname

---

- Syntax** show isis hostname
- Release Information** Command introduced in BXOS Release 3.0.
- Description** Display the details for the IS-IS hostname.
- Additional Information** See the *BXOS Configuration Guide*.

```
show isis hostname cli@BX7000> show isis hostname
SystemID           Hostname
2222.3333.4444    BX7000
2222.3333.4444    BX7000
```

## show isis interface

---

- Syntax** show isis interface
- Release Information** Command introduced in BXOS Release 3.0.
- Description** Display the details for the IS-IS parameters, including the information about the IS-IS interface.
- Additional Information** See the *BXOS Configuration Guide*.
- Output Fields** Contain the details about interface state, circuit ID, circuit type, Link State Packet (LSP) interval, level, priority, metric value, hello interval in milliseconds, and hold interval in milliseconds.

```
show isis interface cli@BX7000> show isis interface
ge-1/0/0
  Index: 3, State: Down, Circuit id: 1, Circuit type: 1
  LSP interval: 984 ms
  Level Priority Metric Hello (s) Hold (s)
  3      64      10      3      10
ge-1/0/0
  Index: 3, State: Down, Circuit id: 1, Circuit type: 1
  LSP interval: 984 ms
  Level Priority Metric Hello (s) Hold (s)
  3      64      10      3      10
ge-1/0/2
  Index: 5, State: Up, Circuit id: 2, Circuit type: 1
  LSP interval: 984 ms
  Level Priority Metric Hello (s) Hold (s)
  3      64      10      10     20
ge-1/0/2
  Index: 5, State: Up, Circuit id: 2, Circuit type: 1
  LSP interval: 984 ms
  Level Priority Metric Hello (s) Hold (s)
  3      64      10      3      10
lo0
  Index: 6, State: Down, Circuit id: 0, Circuit type: 0
  LSP interval: 984 ms, Sysid: 2222.3333.4444
  Level Priority Metric Hello (s) Hold (s)
  3      64      10      3      10
lo0
  Index: 6, State: Down, Circuit id: 0, Circuit type: 0
```

```
LSP interval: 984 ms, Sysid: 2222.3333.4444
Level      Priority      Metric      Hello (s)  H
```

## show l2circuit

---

**Syntax** show l2circuit *pw\_name*  
<brief | detail | extensive | history | status | summary>

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Display the status information about Layer 2 virtual circuits (VCs).

**Options** *pw\_name*—Name of the pseudowire on which L2 circuit is configured.  
  
brief | detail | extensive—(Optional) Display the specified levels of output.  
  
history—(Optional) Display the L2 circuit history information.  
  
status—(Optional) Display L2 circuit status information.  
  
summary—(Optional) Display L2 circuit summary.

**Additional Information** See the *BXOS Configuration Guide*.

**See Also** See the following sections to display the different levels of output:

- show l2circuit p1 brief on page 78
- show l2 circuit p1 detail on page 79
- show l2 circuit p1 extensive on page 80
- show l2 circuit p1 history on page 81
- show l2 circuit p1 status on page 82
- show l2 circuit p1 summary on page 83

**Output Fields** Contain the details about ATM pseudowire statistics, ATM-to-PSN direction cell statistics, and PSN-to-ATM direction cell statistics.

```
show l2circuit p1 brief cli@BX7000> show l2circuit p1 brief
Pw fec id is: 15
L2circuit Neighbor Addr:10.10.10.10
L2circuit Dest address prefix len:32
L2circuit preferred path is ' pri 'and it is RSVP Tunnel
L2circuit route is not dependent on input interface
Pw VC Type and control word bit: 17
Pw group VC FEC : 0
Length of VC FEC interface parameters field: 0
Pw next_hop_list_index : 0
The L2circuit Output inet address which should be used to reach the next
hop is 0.0.0.0
VC setup is signaled with C=1 (Control Word present) and VC setup fails
if the remote LDP peer signals C=0
Pseudo Wire Type : satop
Number of attached Interfaces : 1
```

```

Attached Interface : e1-0/0/0

Payload : 192 bytes  Bit-rate : 32

Jitter buffer : 5000  Sequence window : 6

Alarm set time: 250  Alarm clear time: 300

Idle pattern : 10

Packet loss threshold : 12

Packet sequence threshold: 12

Dynamic time-stamping : absolute
Clock frequency: 0  RTP ssrc : 0

"p1" L2circuit admin status is Enabled.

<<<<<<< SATOP PSW statistics having FEC id:15>>>>>>>>

TDM to PSN Direction
Rx Valid packets : 0
Forwarded packets : 0
Free buffer events : 0
Free buffer drops : 0
MTU drops : 0
Congestion drops : 0

PSN to TDM Direction
Forwarded Packets : 0
Free Buffer drops : 0
Under-run drops : 0
Stray Packets : 0
Malformed Packets : 0
Duplicate Packets : 0
Error Drops : 0
Denied Packets : 0
Reordered Packets : 0
Transit Packets : 0
Dummy Transit Packets : 0
Idle Transit Packets : 0
Out-of-sequence packets : 0
Sequence Window switchover: 0
Buffer over-run events : 0
Buffer under-run events : 0

```

```

show l2 circuit p1 detail cli@BX7000> show l2circuit p1 detail
Pw fec id is: 2
L2circuit LSR Index: 1
L2Circuit MiB Index:2
L2circuit Neighbour Adrs:12.12.12.2
L2circuit Dest addrss prefix len:32
L2circuit route is not dependent on input interface
Pw VC Type and control word bit: 12
Pw group VC FEC : 0
Length of VC FEC interface parameters field: 0
Pw next_hop_list_index : 0
The L2circuit Output inet address which should be used to reach the next
hop is 0.0.0.0
L2circuit Next hop inet address 12.12.12.2
The LDP Peer ID of the remote peer with whom the VC is being set up is
0.0.0.0

```

```

VC setup is signaled with C=1 (Control Word present) but drops back to
C=0 if the remote LDP peer signals C=0
****User Data on the Pseudo wires attachment interfaces****
Pseudo Wire Type type is cell lto1VCC
Number of attached Interfaces:1
Interface Name:t1-0/0/0.1 and its index is :61444
"p1" L2circuit admin status is Enabled.

```

```
<<<<<<< ATM PSW statistics having FEC id:2>>>>>>>>
```

```

L2circuit ID      :2
L2circuit if_ndex:10
L2circuit out tunnel if index:9
L2circuit MPLS in label:16
L2circuit MPLS out label:524290
L2circuit Number of Atm if indices:1
****ATM to PSN Direction packet Statistics****
Forwarded Packets :0
fbp_drop_packets  :0
mtu_drop_packets  :0
****ATM to PSN Direction cell Statistics****
Received Cells      : 0
Received CRC Error  : 0
Rx underflow Error  : 0
IW cells            : 0
FR Dropped          : 0
RAS Timeout         : 0
clp0 cells         : 0
clp1 cells         : 0
****PSN to ATM Direction packet Statistics****
forwarded_packets:0
fbp_drop_packets:0
mtu_drop_packets:0
ttl_drop_packets:0
tx_queue_drop_packets:0
mpls_drop_packets:0
denied_packets:0
out_of_seq_packets:0
non_zero_sn_packets:0
switchover_events:0
port_level_invalid_lbl_packets:0
****PSN to ATM Direction cell Statistics****
Transmit Cells      : 0
Transmit Clp0 Cells : 0
Transmit Clp1 Cells : 0

```

```

show l2 circuit p1 cli@BX7000> show l2circuit p1 extensive
extensive

```

```

Pw fec id is: 2
L2circuit LSR Index: 1
L2Circuit MiB Index:2
L2circuit Neighbor Addr:12.12.12.2
L2circuit Dest address prefix len:32
L2circuit route is not dependent on input interface
Pw VC Type and control word bit: 12
Pw group VC FEC : 0
Length of VC FEC interface parameters field: 0
Pw next_hop_list_index : 0
The L2circuit Output inet address which should be used to reach the next
hop is 0.0.0.0
L2circuit Next hop inet address 12.12.12.2
The LDP Peer ID of the remote peer with whom the VC is being set up is
0.0.0.0

```

```

VC setup is signaled with C=1 (Control Word present) but drops back to
C=0 if the remote LDP peer signals C=0
*****User Data on the Pseudo wires attachment interfaces*****
Pseudo Wire Type type is cell lto1VCC
Number of attached Interfaces:1
Interface Name:t1-0/0/0.1 and its index is :61444
"p1" L2circuit admin status is Enabled.

```

```
<<<<<<< ATM PSW statistics having FEC id:2>>>>>>>>
```

```

L2circuit ID      :2
L2circuit if_ndex:10
L2circuit out tunnel if index:9
L2circuit MPLS in label:16
L2circuit MPLS out label:524290
L2circuit Number of Atm if indices:1
*****ATM to PSN Direction packet Statistics*****
Forwarded Packets   :0
fbp_drop_packets    :0
mtu_drop_packets    :0
*****ATM to PSN Direction cell Statistics*****
Received Cells      : 0
Received CRC Error  : 0
Rx underflow Error  : 0
IW cells            : 0
FR Dropped          : 0
RAS Timeout         : 0
clp0 cells          : 0
clp1 cells          : 0
*****PSN to ATM Direction packet Statistics*****
forwarded_packets:0
fbp_drop_packets:0
mtu_drop_packets:0
ttl_drop_packets:0
tx_queue_drop_packets:0
mpls_drop_packets:0
denied_packets:0
out_of_seq_packets:0
non_zero_sn_packets:0
switchover_events:0
port_level_invalid_lbl_packets:0
*****PSN to ATM Direction cell Statistics*****
Transmit Cells      : 0
Transmit Clp0 Cells : 0
Transmit Clp1 Cells : 0

```

```

show l2 circuit p1 cli@BX7000> show l2circuit p1 history
history

```

```

Pw fec id is: 2
L2circuit LSR Index: 1
L2Circuit MiB Index:2
L2circuit Neighbour Adrs:12.12.12.2
L2circuit Dest adrsss prefix len:32
L2circuit route is not dependent on input interface
Pw VC Type and control word bit: 12
Pw group VC FEC : 0
Length of VC FEC interface parameters field: 0
Pw next_hop_list_index : 0
The L2circuit Output inet address which should be used to reach the next
hop is 0.0.0.0
L2circuit Next hop inet address 12.12.12.2
The LDP Peer ID of the remote peer with whom the VC is being set up is
0.0.0.0

```

```

VC setup is signaled with C=1 (Control Word present) but drops back to
C=0 if the remote LDP peer signals C=0
****User Data on the Pseudo wires attachment interfaces****
Pseudo Wire Type type is cell lto1VCC
Number of attached Interfaces:1
Interface Name:t1-0/0/0.1 and its index is :61444
"p1" L2circuit admin status is Enabled.

```

```
<<<<<<< ATM PSW statistics having FEC id:2>>>>>>>>
```

```

L2circuit ID      :2
L2circuit if_ndex:10
L2circuit out tunnel if index:9
L2circuit MPLS in label:16
L2circuit MPLS out label:524290
L2circuit Number of Atm if indices:1
****ATM to PSN Direction packet Statistics****
Forwarded Packets :0
fbp_drop_packets  :0
mtu_drop_packets  :0
****ATM to PSN Direction cell Statistics****
Received Cells      : 0
Received CRC Error  : 0
Rx underflow Error  : 0
IW cells            : 0
FR Dropped          : 0
RAS Timeout         : 0
clp0 cells          : 0
clp1 cells          : 0
****PSN to ATM Direction packet Statistics****
forwarded_packets:0
fbp_drop_packets:0
mtu_drop_packets:0
ttl_drop_packets:0
tx_queue_drop_packets:0
mpls_drop_packets:0
denied_packets:0
out_of_seq_packets:0
non_zero_sn_packets:0
switchover_events:0
port_level_invalid_lbl_packets:0
****PSN to ATM Direction cell Statistics****
Transmit Cells      : 0
Transmit Clp0 Cells : 0
Transmit Clp1 Cells : 0

```

**show l2 circuit p1 status** cli@BX7000> **show l2circuit p1 status**

```

Pw fec id is: 2
L2circuit LSR Index: 1
L2Circuit MiB Index:2
L2circuit Neighbour Adrs:12.12.12.2
L2circuit Dest addrss prefix len:32
L2circuit route is not dependent on input interface
Pw VC Type and control word bit: 12
Pw group VC FEC : 0
Length of VC FEC interface parameters field: 0
Pw next_hop_list_index : 0
The L2circuit Output inet address which should be used to reach the next
hop is 0.0.0.0
L2circuit Next hop inet address 12.12.12.2

```

```

The LDP Peer ID of the remote peer with whom the VC is being set up is
0.0.0.0
VC setup is signaled with C=1 (Control Word present) but drops back to
C=0 if the remote LDP peer signals C=0
*****User Data on the Pseudo wires attachment interfaces*****
Pseudo Wire Type type is cell lto1VCC
Number of attached Interfaces:1
Interface Name:t1-0/0/0.1 and its index is :61444
"p1" L2circuit admin status is Enabled.

```

```
<<<<<<< ATM PSW statistics having FEC id:2>>>>>>>>
```

```

L2circuit ID :2
L2circuit if_idx:10
L2circuit out tunnel if index:9
L2circuit MPLS in label:16
L2circuit MPLS out label:524290
L2circuit Number of Atm if indices:1
*****ATM to PSN Direction packet Statistics*****
Forwarded Packets :0
fbp_drop_packets :0
mtu_drop_packets :0
*****ATM to PSN Direction cell Statistics*****
Received Cells : 0
Received CRC Error : 0
Rx underflow Error : 0
IW cells : 0
FR Dropped : 0
RAS Timeout : 0
clp0 cells : 0
clp1 cells : 0
*****PSN to ATM Direction packet Statistics*****
forwarded_packets:0
fbp_drop_packets:0
mtu_drop_packets:0
ttl_drop_packets:0
tx_queue_drop_packets:0
mpls_drop_packets:0
denied_packets:0
out_of_seq_packets:0
non_zero_sn_packets:0
switchover_events:0
port_level_invalid_tbl_packets:0
*****PSN to ATM Direction cell Statistics*****
Transmit Cells : 0
Transmit Clp0 Cells : 0
Transmit Clp1 Cells : 0

```

```

show l2 circuit p1 cli@BX7000> show l2circuit p1 summary
summary

```

```

Pw fec id is: 2
L2circuit LSR Index: 1
L2Circuit MiB Index:2
L2circuit Neighbor Adrs:12.12.12.2
L2circuit Dest addrss prefix len:32
L2circuit route is not dependent on input interface
Pw VC Type and control word bit: 12
Pw group VC FEC : 0
Length of VC FEC interface parameters field: 0
Pw next_hop_list_index : 0
The L2circuit Output inet address which should be used to reach the next
hop is 0.0.0.0

```

```
L2circuit Next hop inet address 12.12.12.2
The LDP Peer ID of the remote peer with whom the VC is being set up is
0.0.0.0
VC setup is signaled with C=1 (Control Word present) but drops back to
C=0 if the remote LDP peer signals C=0
****User Data on the Pseudo wires attachment interfaces****
Pseudo Wire Type type is cell lto1VCC
Number of attached Interfaces:1
Interface Name:t1-0/0/0.1 and its index is :61444
"p1" L2circuit admin status is Enabled.
```

```
<<<<<<< ATM PSW statistics having FEC id:2>>>>>>>>
```

```
L2circuit ID :2
L2circuit if_ndex:10
L2circuit out tunnel if index:9
L2circuit MPLS in label:16
L2circuit MPLS out label:524290
L2circuit Number of Atm if indices:1
****ATM to PSN Direction packet Statistics****
Forwarded Packets :0
fbp_drop_packets :0
mtu_drop_packets :0
****ATM to PSN Direction cell Statistics****
Received Cells : 0
Received CRC Error : 0
Rx underflow Error : 0
IW cells : 0
FR Dropped : 0
RAS Timeout : 0
clp0 cells : 0
clp1 cells : 0
****PSN to ATM Direction packet Statistics****
forwarded_packets:0
fbp_drop_packets:0
mtu_drop_packets:0
ttl_drop_packets:0
tx_queue_drop_packets:0
mpls_drop_packets:0
denied_packets:0
out_of_seq_packets:0
non_zero_sn_packets:0
switchover_events:0
port_level_invalid_lbl_packets:0
****PSN to ATM Direction cell Statistics****
Transmit Cells : 0
Transmit Clp0 Cells : 0
Transmit Clp1 Cells
```

## show ldp interface

---

<b>Syntax</b>	show ldp interface <interface-name>
<b>Release Information</b>	Command introduced in BXOS Release 3.0.
<b>Description</b>	Display the interface details for the Link Distribution Protocol (LDP). The interface name is an optional field.
<b>Options</b>	interface <i>interface-name</i> —(Optional) Display the name of an interface on which LDP is configured.
<b>Additional Information</b>	See the <i>BXOS Configuration Guide</i> .
<b>show ldp interface ge-1/0/2</b>	cli@BX7000> show ldp interface ge-1/0/2 ge-1/0/2 Index : 5 Hold time : 15, Local hello interval : 9 Transport address : 111.111.111.1

## show ldp neighbor

---

<b>Syntax</b>	show ldp neighbor
<b>Release Information</b>	Command introduced in BXOS Release 3.0.
<b>Description</b>	Display the LDP neighbor status information.
<b>Additional Information</b>	See the <i>BXOS Configuration Guide</i> .
<b>show ldp neighbor</b>	cli@BX7000> show ldp neighbor Interface name : ge-1/0/1 Index : 4 Admin status : Enabled Hold time : 15, Local hello interval : 5 Transport address : 10.100.65.251

## show ldp overview

---

<b>Syntax</b>	show ldp overview
<b>Release Information</b>	Command introduced in BXOS Release 3.0.
<b>Description</b>	Display the overview for LDP.
<b>Additional Information</b>	See the <i>BXOS Configuration Guide</i> .
<b>show ldp overview</b>	cli@BX7000> show ldp overview show ldp overview State Keepalive-Timeout Hold-time Target-Hello Transport-Addr enable 11.11.11.2 15 11.11.11.1

## show log

- Syntax** show log
- Release Information** Command introduced in BXOS Release 3.0.
- Description** Display the list of system log files.
- Additional Information** See the *BXOS Configuration Guide*.
- Output Fields** Contain the details about access rights, which can be read, write, or execute. File information also includes the user login type, date, time, and memory used by all the users.

```

cli@BX7000> show log
total 806680
drwxr-xr-x 9 root root 4096 Mar 23 04:02 .
drwxr-xr-x 21 root root 4096 Aug 16 2007 ..
-rw-r--r-- 1 root root 318 Nov 26 12:08 a_txt.txt
-rw----- 1 root root 0 Mar 23 04:02 boot.log
-rw----- 1 root root 113 Mar 23 04:02 boot.log.1
-rw----- 1 root root 113 Mar 16 04:02 boot.log.2
-rw----- 1 root root 7483 Mar 9 04:02 boot.log.3
-rw----- 1 root root 113 Mar 2 04:02 boot.log.4
-rw----- 1 root root 2840 Mar 24 11:01 cron
-rw----- 1 root root 14952 Mar 23 04:02 cron.1
-rw----- 1 root root 14911 Mar 16 04:02 cron.2
-rw----- 1 root root 16061 Mar 9 04:02 cron.3
-rw----- 1 root root 15122 Mar 2 04:02 cron.4
drwxr-xr-x 2 lp sys 4096 Mar 23 04:02 cups
-rw-r--r-- 1 root root 6308 Mar 7 20:15 dmesg
drwxr-xr-x 2 root root 4096 Aug 16 2007 gdm
drwx----- 2 root root 4096 Feb 25 2003 httpd
-rw-r--r-- 1 root root 61121 Mar 7 20:15 ksyms.0
-rw-r--r-- 1 root root 61121 Mar 4 10:14 ksyms.1
-rw-r--r-- 1 root root 61121 Mar 4 10:11 ksyms.2
-rw-r--r-- 1 root root 61121 Feb 15 15:00 ksyms.3
-rw-r--r-- 1 root root 61121 Feb 8 20:31 ksyms.4
-rw-r--r-- 1 root root 61121 Feb 8 20:24 ksyms.5
-rw-r--r-- 1 root root 61121 Dec 20 18:01 ksyms.6
-r----- 1 root root 19136220 Mar 24 11:35 lastlog
-rw----- 1 root root 887 Mar 24 04:02 maillog
-rw----- 1 root root 7972 Mar 23 04:02 maillog.1
-rw----- 1 root root 8864 Mar 16 04:02 maillog.2
-rw----- 1 root root 7319 Mar 9 04:02 maillog.3
-rw----- 1 root root 27407 Mar 2 04:02 maillog.4
-rw----- 1 root root 1882 Mar 24 11:43 messages
-rw----- 1 root root 341288 Mar 23 04:02 messages.1
-rw----- 1 root root 176810 Mar 16 04:02 messages.2
-rw----- 1 root root 170898 Mar 9 04:02 messages.3
-rw----- 1 root root 80073 Mar 2 04:02 messages.4
-rw-r--r-- 1 root root 18021 Mar 24 04:02 rpmpkgs
-rw-r--r-- 1 root root 18021 Mar 22 04:02 rpmpkgs.1
-rw-r--r-- 1 root root 18021 Mar 15 04:02 rpmpkgs.2
-rw-r--r-- 1 root root 18021 Mar 8 04:02 rpmpkgs.3
-rw-r--r-- 1 root root 18021 Mar 1 04:02 rpmpkgs.4
drwx----- 2 root root 4096 Mar 14 2003 samba
-rw-r--r-- 1 root root 4220 Aug 16 2007 scrollkeeper.log
-rw----- 1 root root 0 Mar 23 04:02 secure
-rw----- 1 root root 383 Mar 19 15:10 secure.1
-rw----- 1 root root 743 Mar 14 16:38 secure.2

```

```

-rw----- 1 root    root          0 Mar  2 04:02 secure.3
-rw----- 1 root    root        2871 Mar  1 21:28 secure.4
-rw-r--r-- 1 root    root          0 Mar  9 04:02 snmpd.log
-rw-r--r-- 1 root    root    802859416 Mar 24 11:56 snmpd.log.1
-rw-r--r-- 1 root    root    12543957 Mar  7 20:14 snmpd.log.2
-rw-r--r-- 1 root    root      44321 Feb 27 12:35 snmpd.log.3
-rw-r--r-- 1 root    root      44321 Jan  7 17:28 snmpd.log.4
-rw-r--r-- 1 root    root    5234723 Oct  1 10:36 snmpd.log.bk
-rw----- 1 root    root          0 Mar 23 04:02 spooler
-rw----- 1 root    root          0 Mar 16 04:02 spooler.1
-rw----- 1 root    root          0 Mar  9 04:02 spooler.2
-rw----- 1 root    root          0 Mar  2 04:02 spooler.3
-rw----- 1 root    root          0 Feb 24 04:02 spooler.4
drwxr-x--- 2 squid   squid        4096 Jan 25  2003 squid
-rw-r--r-- 1 root    root    764719 Mar 24 11:35 sshd2
drwxr-xr-x 2 root    root        4096 Dec 10 13:56 tac-plus
-rw-r----- 1 root    root    387636 Dec 11 15:02 tac_plus.log
-rw-r--r-- 1 root    root    118280 Mar 24 10:50 ua_log.txt
-rw-r--r-- 1 root    root    500060 Mar 21 18:37 ua_log.txt.1
-rw----- 1 root    root     24576 Mar 14 17:03 .ua_log.txt.swp
drwxr-xr-x 2 root    root        4096 Feb  4  2003 vbox
-rw-rw-r-- 1 root    utmp    328704 Mar 24 11:35 wtmp
-rw-rw-r-- 1 root    utmp    678528 Feb 29 21:27 wtmp.1
-rw-r--r-- 1 root    root      1157 Jan 28 14:55 XFree86.0.log
-rw-r--r-- 1 root    root      1157 Dec 12 21:36 XFree86.0.log.old

```

## show manual-mode

---

- Syntax** show manual-mode
- Release Information** Command introduced in BXOS Release 3.0.
- Description** Display the manual mode status.
- Additional Information** See the *BXOS Configuration Guide*.
- show manual-mode** cli@BX7000> show manual-mode  
Manual mode: enabled

## show memory detail

---

- Syntax** show memory detail
- Release Information** Command introduced in BXOS Release 3.0.
- Description** Display the memory usage of the system.
- Output Fields** Table 19 on page 87 lists the output fields for the show memory command.

**Table 19: show memory detail Output Field Details**

Field Name	Field Description
memTotal	The total memory available for the system.
MemUsed	The bytes of memory used by various processes.
MemShared	The bytes of memory shared between various process.

Field Name	Field Description
Buffers	The bytes of memory used as a temporary storage.
Cached	The size of cache memory.
SwapCached	The bytes of cache memory used for swapping.
SwapTotal	The total memory available for swapping.
SwapFree	The bytes of memory currently available for swapping.
Active	The active bytes of memory.

**show memory detail**

```
cli@BX7000> show memory detail
MemTotal:      223676 kB
MemFree:       64448 kB
Buffers:       118460 kB
Cached:        16476 kB
SwapCached:    0 kB
Active:        23764 kB
Inactive:     127588 kB
HighTotal:     0 kB
HighFree:     0 kB
LowTotal:     223676 kB
LowFree:      64448 kB
SwapTotal:    0 kB
SwapFree:     0 kB
Dirty:        40 kB
Writeback:    0 kB
Mapped:       26144 kB
Slab:         5236 kB
CommitLimit: 111836 kB
Committed_AS: 150720 kB
PageTables:   904 kB
VmallocTotal: 1048560 kB
VmallocUsed:  133328 kB
VmallocChunk: 915204 kB
```

```
*****
                TOTAL MEMORY      FREE MEMORY      USED MEMORY
                In Bytes           In Bytes          In Bytes
*****
Parameter memory:      111132672      107333184         3799488
Packet  memory:      134217728      65261568         68956160
Internal memory:           26928           24572             2356
Host      memory:      33554432      33554432           0
```

**show mf-classifiers**

**Syntax** show mf-classifiers

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Display the multifield classifier information.

**Additional Information** See the *BXOS Configuration Guide*.

```

show mf-classifiers cli@BX7000> show mf-classifiers
Classifier name: cc
Source IP: 33.33.33.2
Source port From : 23
Destination IP : 33.33.33.1
Destination port From : 21
DSCP Value : 0
Protocol : 0
Match Action :
Confirm action , DSCP Mark : 20

```

## show mpls tunnel

---

**Syntax** show mpls tunnel  
< tunnel-name >

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Display the list of all the tunnels configured over the MPLS protocol with the explicit route. You can also specify the name of a particular tunnel to view the details of that tunnel.

**Options** *tunnel-name*—Name of the MLPLS tunnel.

**Additional Information** See the *BXOS Configuration Guide*.

**Output Fields** Contains the details about MPLS tunnel parameters, including ingress and egress IP addresses.

```

show mpls tunnel pri cli@BX7000> show mpls tunnel pri

Ingress LSP: 1 sessions
  To           From           State  LSPname           Labelin Labelout
-----
  2.2.2.2      1.1.1.1        Dn     lsp1               -       -

Total 1 displayed, Up 0, Down 1

Egress LSP: 0 sessions

Total 0 displayed, Up 0, Down 0

```

## show mpls tunnel association

---

**Syntax** show mpls tunnel *tunnel-name* association

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Display the configuration details for the all the tunnel configured over the MPLS.

**Option** *tunnel-name*—Name of the primary MPLS tunnel.  
association—Display the details of all the configured tunnels.

**Additional Information** See the *BXOS Configuration Guide*.

**Output Fields** Contain the details about the outgoing interface, label, state, backup and bypass outgoing label, and bypass outgoing interface.

```

show mpls tunnel pri association cli@BX7000> show mpls tunnel pri association
Primary Tunnel name : pri
Outgoing interface : ge-1/0/1
Outgoing label : 100608
State : UP
Backup outgoing label : 100608
Backup tunnel state : UP
Bypass tunnel name : by
Bypass outgoing label : 0
Bypass outgoing interface : ge-1/0/2
    
```

## show ntp associations

---

**Syntax** show ntp associations

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Display the NTP peers and their state. NTP support synchronizes the device date and time to a common time base in a network. NTP operates over UDP at default port 123.

**Additional Information** See the *BXOS Configuration Guide*.

```

show ntp associations cli@BX7000> show ntp associations
remote      refid      st t when poll reach  delay  offset jitter
=====
10.100.65.110 LOCAL(0)  13 u  2  64   1  0.747  1.026  0.061
    
```

## show ntp status

---

**Syntax** show ntp status

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Display the values of internal variables returned by NTP peers.

**Additional Information** See the *BXOS Configuration Guide*.

**Output Fields** Contain the details about NTP parameters, including version, processor, and system information.

```

show ntp status cli@BX7000> show ntp status
assID=0 status=c011 sync_alarm, sync_unspec, 1 event, event_restart,
version="ntpd 4.2.0a@1:4.2.0a-10-r Sat Dec 17 20:48:47 PST 2005 (1)"?,
processor="mips", system="BXOS/2.6.10_BX7000_R0_03", leap=11,
stratum=16, precision=-14, rootdelay=0.000, rootdispersion=0.090,
peer=0, refid=INIT,
reftime=00000000.00000000 Thu, Feb 7 2036 6:28:16.000, poll=4,
clock=0xcbb87d20.d5fcf3dc, state=0, offset=0.000, frequency=0.000,
error=0.061, jitter=0.061, stability=0.000
    
```

## show ospf database

---

**Syntax** show ospf database  
<brief | detail | extensive>

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Display the database information for the OSPF protocol.

**Options** brief | detail | extensive—(Optional) Display the specified level of output.

**Additional Information** See the *BXOS Configuration Guide*.

**See Also** See the following sections to view the various levels of output:

- show ospf database on page 91
- show ospf database brief on page 91
- show ospf database detail on page 91
- show ospf database extensive on page 92

**Output Fields** Contain the details about gateway type ID, sequence number, age in seconds, checksum, and length.

**show ospf database** cli@BX7000> **show ospf database**  
OSPF link state database, Area 1.1.1.1

Type	ID	Adv Rtr	Seq	Age	Cksum	Len
Router	6.6.6.6	6.6.6.6	0x80000002	330	0x65a1	48
OPAQUE	1.0.0.1	6.6.6.6	0x80000002	370	0x607d	28
OPAQUE	1.0.0.2	6.6.6.6	0x80000002	330	0x1d7a	184

**show ospf database brief** cli@BX7000> **show ospf database brief**  
OSPF link state database, Area 1.1.1.1

Type	ID	Adv Rtr	Seq	Age	Cksum	Len
Router	6.6.6.6	6.6.6.6	0x80000002	1309	0x65a1	48
OPAQUE	1.0.0.1	6.6.6.6	0x80000002	1349	0x607d	28
OPAQUE	1.0.0.2	6.6.6.6	0x80000002	1309	0x1d7a	184

**show ospf database detail** cli@BX7000> **show ospf database detail**  
OSPF link state database, Area 1.1.1.1

Type	ID	Adv Rtr	Seq	Age	Cksum	Len
Router	6.6.6.6	6.6.6.6	0x80000002	332	0x65a1	48
OPAQUE	1.0.0.1	6.6.6.6	0x80000002	372	0x607d	28
OPAQUE	1.0.0.2	6.6.6.6	0x80000002	332	0x1d7a	184

```

show ospf database extensive cli@BX7000> show ospf database extensive
OSPF link state database, Area 1.1.1.1

Type      ID          Adv Rtr      Seq          Age      Cksum  Len
Router    6.6.6.6     6.6.6.6     0x80000002   336     0x65a1  48
OPAQUE    1.0.0.1     6.6.6.6     0x80000002   376     0x607d  28
OPAQUE    1.0.0.2     6.6.6.6     0x80000002   336     0x1d7a  184
    
```

## show ospf interface

**Syntax** show ospf interface *interface-name*  
<brief |detail |extensive>

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Display the interface parameters of OSPF in brief, detail, and extensive levels of output.

**Options** *interface-name*—Name of the OSPF interface.  
brief |detail |extensive—(Optional) Display the specified levels of output.

**Additional Information** See the *BXOS Configuration Guide*.

**See Also** See the following sections to display the output:

- show ospf interface on page 92
- show ospf interface brief on page 92
- show ospf interface detail on page 92
- show ospf interface extensive on page 93

**Output Fields** Contain the details about interface ID on which the OSPF is configured, state, and area range. It also includes the hello, dead, and retransmit interval details.

```

show ospf interface cli@BX7000> show ospf interface
extensive          Show the extensive interface params
brief              Show the brief interface params
detail            Show the detail interface params
    
```

```

show ospf interface brief cli@BX7000> show ospf interface brief
Interface  State  Area  DR ID  BDR ID
ge-1/0/1   BDR    1. 1. 1  11. 11. 11. 2  11. 11. 11. 1
    
```

```

show ospf interface detail cli@BX7000> show ospf interface detail
Interface  State  Area  DR ID  BDR ID
ge-1/0/1   BDR    1. 1. 1  11. 11. 11. 2  11. 11. 11. 1
Type: LAN, address: 11.11.11.1, mask: 255.255.255.0, MTU: 1500,
priority: 1,
Hello: 10, Dead: 40, ReXmit: 5,
Auth type = None
    
```

```

show ospf interface extensive cli@BX7000> show ospf interface extensive
Interface State Area DR ID BDR ID
ge-1/0/1 BDR 1. 1. 1. 1 11.11.11. 2 11.11.11. 1
Type: LAN, address: 11.11.11.1, mask: 255.255.255.0, MTU: 1500,
priority: 1,
Hello: 10, Dead: 40, ReXmit: 5,
Auth type = None

```

## show ospf neighbor

---

**Syntax** show ospf neighbor *neighbor-address*  
<brief | detail>

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Display the OSPF neighbor parameters.

**Options** *neighbor-address*—IP address of the OSPF neighbor.

brief | detail—(Optional) Display the specified levels of output.

**Additional Information** See the *BXOS Configuration Guide*.

**See Also** See the following sections to display the output:

- show ospf neighbor on page 93
- show ospf neighbor brief on page 93
- show ospf neighbor detail on page 93

**Output Fields** Contain the details about IP address, interface on which OSPF is configured, state, ID, priority, and dead interval.

```

show ospf neighbor cli@BX7000> show ospf neighbor
brief Show the brief neighbor params
detail Show the detail neighbor params

```

```

show ospf neighbor brief cli@BX7000> show ospf neighbor brief
Address Interface State ID Pri Dead
11.11.11.2 ge-1/0/1 Full 11.11.11.2 2 35

```

```

show ospf neighbor detail cli@BX7000> show ospf neighbor detail
Address Interface State ID Pri Dead
11.11.11.2 ge-1/0/1 Full 11.11.11.2 2 33
area 1.1.1.1 opt 0x42 Link state retransmission queue length = 0

```

## show policy

---

- Syntax** show policy
- Release Information** Command introduced in BXOS Release 3.0.
- Description** Display the information about the configured routing policies.
- Additional information** See the *BXOS Configuration Guide*.
- show policy**

```
cli@BX7000> show policy
Policy : p1
      Term: t1
      Match-conditions:      From Protocol static
                              Then accept      Metric value: 33      External
      Type: 1
```

## show ports

---

- Syntax** show ports
- Release Information** Command introduced in BXOS Release 3.0.
- Description** Display the T1, E1, and Ethernet ports.
- Additional information** See the *BXOS Configuration Guide*.
- show ports**

```
cli@BX7000> show ports
e1-0/0/0

e1-0/0/1

e1-0/0/2

e1-0/0/3

e1-0/0/4

e1-0/0/5

e1-0/0/6

e1-0/0/7

e1-0/0/8

e1-0/0/9

e1-0/0/10

e1-0/0/11

e1-0/0/12

e1-0/0/13

e1-0/0/14
```

```
e1-0/0/15
ge-1/0/0
ge-1/0/1
ge-1/0/2
```

## show protocols

---

**Syntax** show protocols  
<bfd | isis | ldp | ospf | rsvp | snmp>

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Display the routing protocols configured on the gateway.

**Options** bfd—(Optional) Display the configured parameters for BFD protocol.  
isis—(Optional) Display the configured parameters for IS-IS protocol.  
ldp—(Optional) Display the configured parameters for LDP protocol.  
ospf—(Optional) Display the configured parameters for OSPF protocol.  
rsvp—(Optional) Display the configured parameters for RSVP protocol.  
snmp—(Optional) Display the configured parameters for SNMP protocol.

**Additional information** See the *BXOS Configuration Guide*.

**See Also** See the following sections to display the details for the configured protocols:

- show protocols on page 95
- show protocols bfd on page 96
- show protocols isis on page 96
- show protocols ldp on page 97
- show protocols ospf on page 97
- show protocols rsvp on page 97
- show protocols snmp on page 97

**Output Fields** Contains the parameter details for all the configured protocols.

```
cli@BX7000> show protocols
protocols {
  ospf {
    admin-state enable;
    spf-delay 200;
    area 1.1.1.1 {
      interface ge-1/0/2 {
```

```

        admin-state enable;
    }
}
ldp {
    admin-state enable;
}
rsvp {
    admin-state enable;
}
mpls {
}
static-route {
    route 10.10.0.0/16 {
        next-hop 192.1.1.2;
    }
    route 10.10.1.0/26 {
        next-hop 192.1.1.2;
    }
    route 10.10.1.0/30 {
        next-hop 192.1.1.2;
    }
}
}

```

```

show protocols bfd cli@BX7000> show protocols bfd
protocols{
    bfd {
        receive-interval 0;
        transmit-interval 4294967;
        multiplier 0;
    }
}

```

```

show protocols isis cli@BX7000> show protocols isis
protocols{
    isis {
        enable;
        level 1{
            traffic engineering {
                enable;
            }
            wide-metrics-only 2;
        }
        level 2{
            traffic engineering {
                disable;
            }
            wide-metrics-only 1;
        }
        interface ge-1/0/1 {
            enable;
        }
    }
}

```

```

show protocols ldp cli@BX7000> show protocols ldp
protocols{
  ldp {
    enable;
    interface ge-1/0/1 {
    }
  }
}

show protocols mpls cli@BX7000> show protocols mpls
protocols {
  mpls {
  }
}

show protocols ospf cli@BX7000> show protocols ospf
protocols{
  ospf {
    enable;
    area 1.1.1.1 {
      interface ge-1/0/1 {
        enable;
      }
    }
  }
}

show protocols rsvp cli@BX7000> show protocols rsvp
protocols{
  rsvp {
    enable;
    interface ge-1/0/1 {
      enable;
    }
  }
}

show protocols snmp cli@BX7000> show protocols snmp
system {
  snmp {
    snmp-trap {
      target-ipaddress 10.100.65.122;
      version v1;
    }
  }
}

```

## show qos-profiles

---

- Syntax** show qos-profiles
- Release Information** Command introduced in BXOS Release 3.0.
- Description** Display the QoS profile information.
- Additional Information** See the *BXOS Configuration Guide*.

```

show qos-profiles cli@BX7000> show qos-profiles p1
Policy name: p1
  Policy type: two-rate
  Committed info rate: 551903255657
  Committed burst size: 256
  Peak info rate: 2201170697321
  Peak burst size: 1024
  Conform action : Mark, DSCP Value: 55
  Exceed action  : Mark, DSCP Value : 11
  Violate action : Drop
Policy name: pp
  Policy type: two-rate
  Committed info rate: 551903255657
  Committed burst size: 256
  Peak info rate: 2201170697321
  Peak burst size: 1024
  Conform action : Mark, DSCP Value : 25
  Exceed action  : Mark, DSCP Value : 11
  Violate action : Drop
    
```

## show qos-scheduler

---

**Syntax** show qos-scheduler

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Display the QoS scheduler information.

**Additional Information** See the *BXOS Configuration Guide*.

```

show qos-profiles cli@BX7000> show qos-scheduler
Interface name: ge-1/0/1
  Expedited forwarding
  Priority      : 0
  Assured forwarding
  Type         : WFQ
  Subclass: 1
    Weight      : 20
    Green priority : 20
    Yellow priority: 20
    Red priority  : 20
  Subclass: 2
    Weight      : 30
    Green priority : 30
    Yellow priority: 30
    Red priority  : 30
  Subclass: 3
    Weight      : 40
    Green priority : 40
    Yellow priority: 40
    Red priority  : 40
  Subclass: 4
    Weight      : 50
    Green priority : 50
    Yellow priority: 50
    Red priority  : 50
  Best effort forwarding
  Priority      : 20
  Shaper name: sh1
    
```

## show qos-shaper

---

- Syntax** show qos-shaper
- Release Information** Command introduced in BXOS Release 3.0.
- Description** Display the QoS shaper information.
- Additional Information** See the *BXOS Configuration Guide*.

```
cli@BX7000> show qos-shaper sh2
Name                : sh1
Type                 : cir
Committed info rate : 10000 Mbps
Committed burst size: 256 bytes
```

## show qos-statistics

---

- Syntax** show qos-statistics
- Release Information** Command introduced in BXOS Release 3.0.
- Description** Display the QoS statistics information.
- Additional Information** See the *BXOS Configuration Guide*.

**Output Fields** Contain the default values for policer packets. The CLI updates the counters if some policing action is carried out and there are packet drops.

```
cli@BX7000> show qos-statistics
Policer non-conforming packets - 0
Policer first bucket non-conforming packets - 0
```

## show radius-server

---

- Syntax** show radius-server
- Release Information** Command introduced in BXOS Release 3.0.
- Description** Display the details of RADIUS server configuration parameters.
- Additional information** See the *BXOS Configuration Guide*.
- Output Fields** Contain the details about the RADIUS server, including server address, accounting port number, port number, retry number, password, and authentication timeout.

```

show radius-server cli@BX7000> show radius-server
Radius server configuration details
  Radius Server Address           :192.168.1.1

  Radius Server Accounting Port number :0

  Radius Server Port number       :1812

  Radius Server Retry number      :100

  Radius Server secret-password   :test

  Radius Server authentication timeout :1
    
```

## show route

---

**Syntax** show route

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Display the complete gateway information, including information about the routing table and the interface configured on the gateway.

**Additional Information** See the *BXOS Configuration Guide*.

**Output Fields** Contain the destination prefix, outgoing interface, metric values, next hop, protocol, age, and preference.

```

show route cli@BX7000> show route
C = Connected, S = Static, O = OSPF, I = ISIS, * = Next hop is not set
1 destinations 1 routes
Destination prefix Outgoing interface Metric Next hop Protocol Age Preference
10.100.65.0/24 (via):ge-1/0/0 1 * C - 1
    
```

## show rsvp interface

---

**Syntax** show rsvp interface

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Show the interface details for the RSVP.

**Additional Information** See the *BXOS Configuration Guide*.

**Output Fields** Contain the type of interface, operational status of the interface, available and reserved bandwidth, and number of tunnels running on the same interface.

```

show rsvp interface cli@BX7000> show rsvp interface

Physical Interface : ge-1/0/1    Index : 4
Operational state : Enabled
Available Bandwidth : 1000.00 Mbps    Reserved Bandwidth : 0 bps
Number of tunnels running on this interface : 1
    
```

## show rsvp session

---

- Syntax** show rsvp session
- Release Information** Command introduced in BXOS Release 3.0.
- Description** Show the details of the RSVP tunnels that are in up state.
- Additional Information** See the *BXOS Configuration Guide*.
- Output Fields** Contain the details about ingress and egress RSVP sessions.

```
cli@BX7000> show rsvp session
Ingress RSVP: 2 sessions
To          From          State  LSPname      Labelin Labelout
  1.1.1.1    2.2.2.2      Up     s1            -       3
  1.1.1.1    2.2.2.2      Up     fw            -     1048575

Total 2 displayed, Up 2, Down 0

Egress RSVP: 0 sessions
Total 0 displayed, Up 0, Down 0
```

## show snmpv3

---

- Syntax** show snmpv3  
<groups | users | view>
- Release Information** Command introduced in BXOS Release 3.0.
- Description** Display the SNMPv3 details.
- Options** groups—(Optional) Display the SNMPv3 group details.  
users—(Optional) Display SNMPv3 user details.  
view—(Optional) Display SNMPv3 view details.
- Output Fields** Contain the details about SNMPv3 groups, user, and view.
- Additional Information** See the *BXOS Configuration Guide*.

```
cli@BX7000> show snmp v3 groups
Security-model      Security-name      Group-name
v2c                 cli                grpmib2
```

```
cli@BX7000> show snmp v3 users
User      Auth/Priv
cli       auth/priv
```

```
cli@BX7000> show snmp v3 view
Viewname      oid      Include/Exclude
v1            1.3.6.1.2.1  include
```

## show source-filter

---

- Syntax** show source-filter *interface-name*
- Release Information** Command introduced in BXOS Release 3.0.
- Description** Display the MAC filters.
- Options** *interface-name*—Name of the interface.
- Output Fields** Contain the MAC address of the peer device to receive data.
- Additional Information** See the *BXOS Configuration Guide*.

```

show source-filter cli@BX7000> show source-filter ge-1/0/1
ge-1/0/1
ge-1/0/1 MAC Filters :
    mac filter:00:11:22:33:11:00
    
```

## show statistics gre-tunnel

---

- Syntax** show statistics gre-tunnel *tunnel-name*
- Release Information** Command introduced in BXOS Release 3.0.
- Description** Display the GRE tunnel statistics details.
- Options** *tunnel-name*—Name of the GRE tunnel.
- Additional Information** See the *BXOS Configuration Guide*.
- Output Fields** Contain the status of GRE tunnel, source and destination addresses, and tunnel up-time.

**Table 20: show statistics gre-tunnel Output Field Details**

Field Name	Field Description
GRE tunnel name	The name of the tunnel.
Operational status	The status of the tunnel.
Source address	The source of the tunnel.
Tunnel up time	The time at which the GRE tunnel is enabled.

```

show statistics cli@BX7000> show statistics gre-tunnel gr-r
gre-tunnel gr-r
GRE Tunnel Name : "gr-r" , Enabled
Operational status : Enabled
Source Address:5.5.5.5 Destination Address:88.88.1.2
Tunnel Up Time:1970-01-01 00:00:21 UTC
    
```

## show statistics ipv4

---

- Syntax** show statistics ipv4
- Release Information** Command introduced in BXOS Release 3.0.
- Description** Display the statistics details for IP version 4 (IPv4).
- Additional Information** See the *BXOS Configuration Guide*.
- Output Fields** Contain the order and the amount of information carried by IPv4 data packets.

**Table 21: show statistics ipv4 Output Field Details**

Field Name	Field Description
Total received packets	The total number of valid IP packets received.
Host term IPv4 packets	The number of IPv4 packets without an option field. These packets are host terminated.
Host term Ipv4 option packets	The number of IPv4 packets with an option field. These packets are host terminated.
ost term OSPF packets	The number of OSPF packets sent to host. These packets are host terminated.
Received ARP packets	The number of ARP packets received.
Protocol error	The number of invalid IP packets.
Checksum error	The number of IPv4 packets with a header checksum error.
Forwarded packets	The number of packets forwarded.

```

show statistics ipv4 cli@BX7000> show statistics ipv4
Total received packets : 390599 pps
Host term IPv4 packets : 390599 pps
Host term Ipv4 option packets : 0 pps
ost term OSPF packets : 0 pps
Received ARP packets : 100400 pps
Protocol Error : 0
Checksum Error : 0
Forwarded packets : 0

```

## show statistics l2circuit

---

- Syntax** show statistics l2circuit *pseudowire-name*
- Release Information** Command introduced in BXOS Release 3.0.
- Description** Display the statistics details about ATM and SAToP pseudowires.
- Options** *pseudowire-name*—Name of the ATM or SAToP pseudowire.
- Additional Information** See the *BXOS Configuration Guide*.
- Output Fields** Contain the details about pseudowire statistics and PSN-to-ATM statistics which include packet statistics and ATM Adaptation Layer (AAL) statistics.

**Table 22: show statistics I2circuit Output Field Details**

Field Name	Field Description
Received packets	Total number of the valid received packets by the SAToP interworking function (SAToP IWF) from the PSN-bound direction.
Free buffer drops	The packets dropped due to lack of buffers present in the fast path.
Under-run drops	The number of times the transmit buffer is present in the fast path.
Stray packets	The packets detected by the SAToP IWF from the PSN-bound direction. The number of stray packets are increased when RTP and the SSRC field in the RTP header are used.
Malformed packets	The packets detected by the SAToP IWF from the PSN-bound direction. These packets are increased when the received packet size does not match the expected packet size in the pseudowire and the RTP header payload type value is incorrect.
Duplicate packets	The number of duplicate packets received by the SAToP IWF from the PSN-bound direction.
Error drops	The number of packets dropped due to CRC error by the SAToP IWF from the PSN-bound direction.
Denied packets	The packets that are not allowed by the SAToP IWFs from the PSN-bound direction.
Recorded packets	The number of packets reordered by the SAToP IWF with reference to the sequence number.
Transit packets	The number of forwarded packets.
Dummy transit packets	The number of times a dummy packet is transmitted by the SAToP IWF due to a lost pseudowire packet.
Idle transit packets	The number of times an idle packet passed over TDM.
Out-of-sequence packets	The number of packets reordered by the SAToP IWF when these packets are sent from the PSN-bound direction.
Buffer run-over	The number of packets dropped by the SAToP IWF when the sequence number in the SAToP packet is more than the jitter buffer size.
Buffer under-run	The number of times the transmit buffer under-run event was hit when packets are transmitted from the PSN-bound direction towards CE-bound direction through the SAToP IWF.
Rx valid packets	The number of valid data packets forwarded to the PSN-bound direction by the SAToP IWF.
Forwarded packets	The number of forwarded packets to the PSN-bound direction by the SAToP IWF.
Free buffer events	The number of times the event packets dropped due to lack of buffers in the SAToP IWF while transmitting pseudowire packets towards the PSN.
Free buffer drops	Packets dropped due to lack of buffers in the SAToP IWF while transmitting pseudowire packets towards the PSN.
MTU drops	The number of packets dropped when the packet length is more than the MTU size.
Congestion drops	The number of packets dropped due to congestion in the transmit queue.

```
show statistics l2circuit p1
cli@BX7000> show statistics l2circuit p1
```

```
Pseudo-Wire Statistics :
```

```
=====
                          PSN to TDM Direction
=====
Received Packets : 2276
Free Buffer drops : 0
Under-run drops : 0
Stray Packets : 0
Malformed Packets : 0
Duplicate Packets : 301
Error Drops : 0
Denied Packets : 0
Reordered Packets : 0
Transit Packets : 57
Dummy Transit Packets : 54
Idle Transit Packets : 41794
Out-of-sequence packets : 28597
Sequence Window: 0
Buffer over-run events : 0
Buffer under-run events : 43
Operational status : up

=====
                          TDM to PSN Direction
=====
Rx Valid packets : 1417963
Forwarded packets : 1417963
Free buffer events : 0
Free buffer drops : 0
MTU drops : 0
Congestion drops : 0
```

## show statistics rsvp-tunnel

- Syntax** `show statistics rsvp-tunnel tunnel-name`
- Release Information** Command introduced in BXOS Release 3.0.
- Description** Display the RSVP tunnel statistics details.
- Options** *tunnel-name*—Name of the RSVP tunnel.
- Additional Information** See the *BXOS Configuration Guide*.
- Output Fields** Contain the details about number of packets forwarded and discarded over the tunnel. Also contain the details for erroneous packets and octets forwarded.

**Table 23: show statistics rsvp-tunnel Output Field Details**

Field Name	Field Description
Tunnel name	The name of the RSVP tunnel.
Forwarded packets	The number of packets forwarded over the RSVP tunnel.
Discarded packets	The number of packets discarded over the RSVP tunnel.

```

show statistics cli@BX7000> show statistics rsvp-tunnel tnn13
rsvp-tunnel
          *****Tunnel statistics*****
          Tunnel Name   : "tnn13"
          Forwarded packets: 3075167
          Error packets  : 0
          Discarded packets: 0
          Octets Forwarded : 0
    
```

## show syslog

---

**Syntax** show syslog

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Display the system log file configuration details.

**Additional Information** See the *BXOS Configuration Guide*.

**Output Fields** Contains the details about system log file, user terminals, and archive files.

```

show syslog cli@BX7000> show syslog

file /var/log/messages
{
  *.info
  cron.none
}

file /var/log/cron
{
  cron.*
}

user *
{
  *.emerg
}

archive
{
  rotate 4
  size=1000k
}
    
```

## show system processes

---

**Syntax** show system processes  
<brief | detail | extensive>

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Display the details about all processes running on the gateway.

**Options** brief | detail | extensive—(Optional) Display the specified level of output.

**Additional Information** See the *BXOS Configuration Guide*.

**Output Fields** Contain the details about process ID, terminal type, time taken by each process, and the command by which it is initiated.

```
cli@BX7000> show system processes
show system processes
  PID TTY      STAT   TIME COMMAND
    1 ?        S       0:04  init
    2 ?        SW      0:00  [keventd]
    3 ?        SW      0:00  [kapmd]
    4 ?        SWN     0:00  [ksoftirqd_CPU0]
    9 ?        SW      0:00  [bdflush]
    5 ?        SW      0:10  [kswapd]
    6 ?        SW      0:00  [kscand/DMA]
    7 ?        SW      0:00  [kscand/Normal]
    8 ?        SW      0:00  [kscand/HighMem]
   10 ?        SW      0:00  [kupdated]
   11 ?        SW      0:00  [mdrecoveryd]
   15 ?        SW      0:29  [kjournald]
   73 ?        SW      0:00  [khubd]
  2796 ?        SW      0:00  [kjournald]
  3069 ?        SW      0:00  [eth0]
  3122 ?        S       0:00  /sbin/dhclient -1 -q -lf
/var/lib/dhcp/dhclient-eth0.leases -pf /var/run/dhclient-eth0.pid -cf /et
  3180 ?        S       0:00  syslogd -m 0
  3184 ?        S       0:00  klogd -x
  3202 ?        SW      0:00  [portmap]
  3221 ?        SW      0:00  [rpc.statd]
  3288 ?        S       0:00  /usr/sbin/apmd -p 10 -w 5 -W -P
/etc/sysconfig/apm-scripts/apmscript
  3325 ?        S       0:09  /usr/sbin/sshd
  3339 ?        S       0:00  xinetd -stayalive -reuse -pidfile /var/run/xinetd.pid
  3359 ?        S       0:00  [sendmail]
  3368 ?        S       0:00  [sendmail]
  3378 ?        S       0:00  gpm -t imps2 -m /dev/mouse
  3387 ?        S       0:00  crond
  3500 ?        S       0:00  [xfs]
  3518 ?        S       0:00  [atd]
  3527 tty2      S       0:00  /sbin/mingetty tty2
  3528 tty3      S       0:00  /sbin/mingetty tty3
  3529 tty4      S       0:00  /sbin/mingetty tty4
  3530 tty5      S       0:00  /sbin/mingetty tty5
  3531 tty6      S       0:00  /sbin/mingetty tty6
  3532 ?        S       0:03  /usr/sbin/sshd
  3534 ?        S       0:58  [sshd]
  3535 pts/0     S       0:08  -bash
  3569 ?        S       0:02  /usr/sbin/sshd
  3571 ?        SW      0:39  [sshd]
  3572 pts/1     S       0:05  -bash
  3606 ?        S       0:01  /usr/sbin/sshd
  3608 ?        SW      0:50  [sshd]
  3609 pts/2     S       0:01  -bash
  3643 ?        S       0:03  /usr/sbin/sshd
  3645 ?        S       0:47  [sshd]
  3646 pts/3     S       0:00  -bash
  3680 ?        S       0:03  /usr/sbin/sshd
  3682 ?        S       0:46  [sshd]
  3683 pts/4     S       0:00  -bash
  3717 ?        S       0:03  /usr/sbin/sshd
  3719 ?        S       0:46  [sshd]
  3720 pts/5     S       0:00  -bash
  3754 ?        S       0:03  /usr/sbin/sshd
```

```

3756 ?      S      0:46 [sshd]
3757 pts/6   S      0:00 -bash
3791 ?      S      0:03 /usr/sbin/sshd
3793 ?      S      0:46 [sshd]
3794 pts/7   S      0:00 -bash
3828 ?      S      0:03 /usr/sbin/sshd
3830 ?      S      0:46 [sshd]
3831 pts/8   S      0:00 -bash
3865 pts/8   SW     0:00 [su]
3866 pts/8   S      0:00 bash
3894 pts/7   SW     0:00 [su]
3895 pts/7   S      0:00 bash
3923 pts/6   SW     0:00 [su]
3924 pts/6   S      0:00 bash
3952 pts/5   SW     0:00 [su]
3953 pts/5   S      0:00 bash
3980 pts/4   SW     0:00 [su]
3981 pts/4   S      0:00 bash
4008 pts/3   SW     0:00 [su]
4009 pts/3   S      0:00 bash
25374 ?     S      0:03 ./snmpd
 9589 tty1    S      0:00 /sbin/mingetty tty1
13650 pts/3   T      0:00 vi /var/log/ua_log.txt
16230 pts/3   T      0:00 gdb ua
29530 pts/2   T      0:00 ./cli
29570 pts/2   TW     0:00 [ping]
29652 pts/2   T      0:00 ./cli
29655 pts/2   T      0:00 ./cli
29658 pts/2   TW     0:00 [ping]
29423 pts/2   T      0:00 ./cli
29426 pts/2   TW     0:00 [ping]
29572 pts/2   T      0:00 ./cli
29575 pts/2   TW     0:00 [ping]
30866 ?     S      0:01 /usr/sbin/sshd
30868 ?     S      0:19 [sshd]

```

## show system storage

---

**Syntax** show system storage

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Display the local storage data in the system.

**Additional Information** See the *BX 7000 Multi-access Gateway Hardware Guide*.

```

cli@BX7000> show system storage
Filesystem      1K-blocks      Used Available Use% Mounted on
/dev/hda2        37848096 33206308  2719212  93% /
/dev/hda1         101089     9321     86549  10% /boot
none             123592         0     123592   0% /dev/shm

```

## show system uptime

---

<b>Syntax</b>	show system uptime
<b>Release Information</b>	Command introduced in BXOS Release 3.0.
<b>Description</b>	Display the current date and time of the system.
<b>Additional Information</b>	See the <i>BXOS Configuration Guide</i> .
<b>show system uptime</b>	cli@BX7000> <b>show system uptime</b> Current time: Fri Jul 11 10:44:33 IST 2008 10:44:33 up 34 days, 19:31, 19 users, load average: 0.00, 0.00, 0.00

## show system users

---

<b>Syntax</b>	show system users																																																																																																																																												
<b>Release Information</b>	Command introduced in BXOS Release 3.0.																																																																																																																																												
<b>Description</b>	Display the currently logged in users.																																																																																																																																												
<b>show system users</b>	cli@BX7000> <b>show system users</b> 10:27:35 up 34 days, 19:14, 19 users, load average: 0.00, 0.00, 0.00 <table> <thead> <tr> <th>USER</th> <th>TTY</th> <th>LOGIN@</th> <th>IDLE</th> <th>JCPU</th> <th>PCPU</th> <th>WHAT</th> </tr> </thead> <tbody> <tr> <td>root</td> <td>tty1</td> <td>6Jun08</td> <td>8days</td> <td>0.00s</td> <td>0.00s</td> <td>-bash</td> </tr> <tr> <td>abc</td> <td>pts/0</td> <td>21Jun08</td> <td>17days</td> <td>0.38s</td> <td>0.38s</td> <td>-bash</td> </tr> <tr> <td>abc</td> <td>pts/1</td> <td>21Jun08</td> <td>15:33m</td> <td>0.26s</td> <td>3.87s</td> <td>/usr/sbin/sshd</td> </tr> <tr> <td>abc</td> <td>pts/2</td> <td>21Jun08</td> <td>15:33m</td> <td>0.19s</td> <td>3.54s</td> <td>/usr/sbin/sshd</td> </tr> <tr> <td>abc</td> <td>pts/3</td> <td>21Jun08</td> <td>15:33m</td> <td>0.10s</td> <td>3.38s</td> <td>/usr/sbin/sshd</td> </tr> <tr> <td>abc</td> <td>pts/4</td> <td>21Jun08</td> <td>15:47m</td> <td>0.34s</td> <td>3.68s</td> <td>/usr/sbin/sshd</td> </tr> <tr> <td>abc</td> <td>pts/5</td> <td>21Jun08</td> <td>15:47m</td> <td>0.61s</td> <td>3.67s</td> <td>/usr/sbin/sshd</td> </tr> <tr> <td>abc</td> <td>pts/6</td> <td>21Jun08</td> <td>15:33m</td> <td>0.93s</td> <td>0.93s</td> <td>-bash</td> </tr> <tr> <td>abc</td> <td>pts/7</td> <td>21Jun08</td> <td>7days</td> <td>0.77s</td> <td>0.02s</td> <td>./cli</td> </tr> <tr> <td>abc</td> <td>pts/8</td> <td>26Jun08</td> <td>15:48m</td> <td>4.24s</td> <td>4.24s</td> <td>-bash</td> </tr> <tr> <td>abc1</td> <td>pts/9</td> <td>10:14am</td> <td>13:15</td> <td>0.04s</td> <td>0.04s</td> <td>-bash</td> </tr> <tr> <td>abc</td> <td>pts/14</td> <td>26Jun08</td> <td>15:48m</td> <td>4.54s</td> <td>4.54s</td> <td>-bash</td> </tr> <tr> <td>smith</td> <td>pts/16</td> <td>10:25am</td> <td>1.00s</td> <td>0.06s</td> <td>0.01s</td> <td>./xyzcli</td> </tr> <tr> <td>John</td> <td>pts/13</td> <td>Mon10am</td> <td>3days</td> <td>0.05s</td> <td>0.05s</td> <td>-bash</td> </tr> <tr> <td>John</td> <td>pts/15</td> <td>Mon10am</td> <td>2days</td> <td>0.11s</td> <td>0.11s</td> <td>-bash</td> </tr> <tr> <td>John</td> <td>pts/18</td> <td>4Jul08</td> <td>40:26m</td> <td>0.21s</td> <td>0.21s</td> <td>-bash</td> </tr> <tr> <td>John</td> <td>pts/12</td> <td>Mon10am</td> <td>18:38m</td> <td>0.96s</td> <td>0.96s</td> <td>-bash</td> </tr> <tr> <td>John</td> <td>pts/11</td> <td>Mon10am</td> <td>24:01m</td> <td>0.09s</td> <td>0.26s</td> <td>/usr/X11R6/bin/xterm -ls -displ</td> </tr> <tr> <td>Ann</td> <td>pts/22</td> <td>4Jul08</td> <td>16:38m</td> <td>0.19s</td> <td>0.02s</td> <td>/usr/sbin/sshd</td> </tr> </tbody> </table>	USER	TTY	LOGIN@	IDLE	JCPU	PCPU	WHAT	root	tty1	6Jun08	8days	0.00s	0.00s	-bash	abc	pts/0	21Jun08	17days	0.38s	0.38s	-bash	abc	pts/1	21Jun08	15:33m	0.26s	3.87s	/usr/sbin/sshd	abc	pts/2	21Jun08	15:33m	0.19s	3.54s	/usr/sbin/sshd	abc	pts/3	21Jun08	15:33m	0.10s	3.38s	/usr/sbin/sshd	abc	pts/4	21Jun08	15:47m	0.34s	3.68s	/usr/sbin/sshd	abc	pts/5	21Jun08	15:47m	0.61s	3.67s	/usr/sbin/sshd	abc	pts/6	21Jun08	15:33m	0.93s	0.93s	-bash	abc	pts/7	21Jun08	7days	0.77s	0.02s	./cli	abc	pts/8	26Jun08	15:48m	4.24s	4.24s	-bash	abc1	pts/9	10:14am	13:15	0.04s	0.04s	-bash	abc	pts/14	26Jun08	15:48m	4.54s	4.54s	-bash	smith	pts/16	10:25am	1.00s	0.06s	0.01s	./xyzcli	John	pts/13	Mon10am	3days	0.05s	0.05s	-bash	John	pts/15	Mon10am	2days	0.11s	0.11s	-bash	John	pts/18	4Jul08	40:26m	0.21s	0.21s	-bash	John	pts/12	Mon10am	18:38m	0.96s	0.96s	-bash	John	pts/11	Mon10am	24:01m	0.09s	0.26s	/usr/X11R6/bin/xterm -ls -displ	Ann	pts/22	4Jul08	16:38m	0.19s	0.02s	/usr/sbin/sshd
USER	TTY	LOGIN@	IDLE	JCPU	PCPU	WHAT																																																																																																																																							
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abc	pts/2	21Jun08	15:33m	0.19s	3.54s	/usr/sbin/sshd																																																																																																																																							
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abc	pts/4	21Jun08	15:47m	0.34s	3.68s	/usr/sbin/sshd																																																																																																																																							
abc	pts/5	21Jun08	15:47m	0.61s	3.67s	/usr/sbin/sshd																																																																																																																																							
abc	pts/6	21Jun08	15:33m	0.93s	0.93s	-bash																																																																																																																																							
abc	pts/7	21Jun08	7days	0.77s	0.02s	./cli																																																																																																																																							
abc	pts/8	26Jun08	15:48m	4.24s	4.24s	-bash																																																																																																																																							
abc1	pts/9	10:14am	13:15	0.04s	0.04s	-bash																																																																																																																																							
abc	pts/14	26Jun08	15:48m	4.54s	4.54s	-bash																																																																																																																																							
smith	pts/16	10:25am	1.00s	0.06s	0.01s	./xyzcli																																																																																																																																							
John	pts/13	Mon10am	3days	0.05s	0.05s	-bash																																																																																																																																							
John	pts/15	Mon10am	2days	0.11s	0.11s	-bash																																																																																																																																							
John	pts/18	4Jul08	40:26m	0.21s	0.21s	-bash																																																																																																																																							
John	pts/12	Mon10am	18:38m	0.96s	0.96s	-bash																																																																																																																																							
John	pts/11	Mon10am	24:01m	0.09s	0.26s	/usr/X11R6/bin/xterm -ls -displ																																																																																																																																							
Ann	pts/22	4Jul08	16:38m	0.19s	0.02s	/usr/sbin/sshd																																																																																																																																							

## show system virtual-memory

---

<b>Syntax</b>	show system virtual-memory
<b>Release Information</b>	Command introduced in BXOS Release 3.0.
<b>Description</b>	Display the detail of virtual memory partitions available on the system.
<b>Output Fields</b>	Contain the details about memory buffer, memory free, memory used for swapping, and cache memory.

```

show system virtual-memory cli@BX7000> show system virtual-memory
procs -----memory-----swap-- ----io---- --system-- ----cpu----
 r b  swpd  free  buff  cache  si  so  bi  bo  in  cs  us  sy  id  wa
 2  0      0 35584 118460 39576  0  0  3  7 2005  221  4 96  0  0
    
```

## show tacplus-server

---

**Syntax** show tacplus-server

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Display the details about TACACS + server configuration parameters.

**Additional Information** See the *BXOS Configuration Guide*.

**Output Fields** Contain the TACACS + server address, port number, secret password, and the authentication timeout.

```

show tacplus-server cli@BX7000> show tacplus-server
Tacplus Server Configuration Details
  Tacplus server Address           :192.168.1.1
  Tacplus Server Port number      :1813
  Tacplus Server Secret Password  :test
  Tacplus Server Authentication timeout :100
    
```

## show version

---

**Syntax** show version

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Display the information about the kernel and the gateway software version.

**Additional Information** See the *BXOS Configuration Guide*.

**Output Fields** Contain the kernel information and the software current version.

```

show version cli@BX7000> show version
Software image name : bxos-install-3.0I18.4
Software build no : 18.4
Packet forwarding engine : 3.1.2
Routing engine : 2007
Build date : Fri May 23 13:52:39 IST 2008
Kernel : 2.6.10_BX7000_R0_03
    
```

## show zerotouch

---

**Syntax** show zerotouch

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Display the zero touch mode details.

**Additional Information** See the *BXOS Configuration Guide*.

**show zerotouch** cli@BX7000> **show zerotouch**  
Zerotouch mode: disabled



## Chapter 7

# Summary of CLI Environmental Mode Commands

This chapter presents the environmental mode commands available in the BX operating system (BXOS) software. Use the environmental commands to control the BXOS command-line interface (CLI) environment. You can set and display the CLI prompt and banner by using the environmental command. Commands are listed in alphabetical order.

Table 24 on page 113 summarizes the CLI environmental mode commands.

**Table 24: BXOS Environmental Mode Commands**

Task	Command
Set the CLI banner.	set cli banner on page 113
Set the CLI hostname.	set cli hostname on page 114
Set the CLI prompt.	set cli prompt on page 114
Display the current settings of the CLI.	show cli on page 115

### set cli banner

<b>Syntax</b>	set cli banner <i>string</i>
<b>Release Information</b>	Command introduced in BXOS Release 3.0.
<b>Description</b>	Set the CLI banner, which is displayed on the top of the CLI when it starts.
<b>Options</b>	<i>string</i> —CLI banner string which includes the text that you want to display in the banner.
<b>Additional Information</b>	See “CLI Command Categories” on page 23.
<b>Required Privilege Level</b>	view



## show cli

---

**Syntax** show cli

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Display the current settings of the CLI environment variables. The environment variables include the banner that appears at the top of the command-line prompt and the user login details.

**Additional Information** See the *BXOS Configuration Guide*.

```
show cli cli@BX7000> show cli
CLI Banner          : BX7000 CLI Environment
CLI Prompt string  : user
Current Time Stamp : Wed May 14 14:06:37 IST 2008
Working directory  : /home/abc/Work/Dec21/xyzroot
```



## Chapter 8

# Summary of CLI Operational Mode Commands

This chapter presents the operational mode commands available in the BX operating system (BXOS) software. Use the BXOS command-line interface (CLI) operational mode commands to control the CLI environment and monitor and troubleshoot the interfaces, protocols, and system properties. Commands are listed in alphabetical order.

Table 25 on page 117 summarizes the CLI operational mode commands.

**Table 25: BXOS Operational Mode Commands**

<b>Task</b>	<b>Command</b>
Clear statistics information.	clear on page 118
Enter the configuratin mode.	configure on page 118
Quit the CLI.	exit on page 118
Perform file operations.	file on page 119
Obtain help on commands.	help on page 119
Display the CLI history.	history on page 119
Monitor the system processes.	monitor on page 120
Determine reachability of a network host.	ping on page 120
Determine reachability of a network host over MPLS.	ping-mpls on page 121
Restart the gateway.	request system reboot on page 121
Set the CLI environment.	set on page 122
Display the software aspects.	show on page 122
Configure SSH services.	ssh on page 124
Trace the route for a remote address.	traceroute on page 124

## clear

---

<b>Syntax</b>	clear (counters   history   log)
<b>Release Information</b>	Command introduced in BXOS Release 3.0.
<b>Description</b>	Clear statistics, interface, and protocol data information for the gateway.
<b>Options</b>	<b>counters</b> —Clear the counter entries, including interface, IPv4, pseudowire, and tunnel statistics. <b>history</b> —Clear the CLI command history. <b>log</b> —Clear the system log information.
<b>Additional Information</b>	See “CLI Command Categories” on page 23.
<b>Required Privilege Level</b>	shell and maintenance

## configure

---

<b>Syntax</b>	configure
<b>Release Information</b>	Command introduced in BXOS Release 3.0.
<b>Description</b>	Enter the configuration mode.
<b>Additional Information</b>	See Switching Between Operational Mode and Configuration Mode on page 11.
<b>Required Privilege Level</b>	configuration mode

## exit

---

<b>Syntax</b>	exit
<b>Release Information</b>	Command introduced in BXOS Release 3.0.
<b>Description</b>	Quit the CLI session.
<b>Additional Information</b>	See “CLI Command Categories” on page 23.
<b>Required Privilege Level</b>	shell and maintenance

## file

---

<b>Syntax</b>	file (copy   delete   list   rename   show)
<b>Release Information</b>	Command introduced in BXOS Release 3.0.
<b>Description</b>	Copy configuration files from one location to another either on the same gateway or on the remote host. Rename and delete the configuration files residing on the gateway. Generate a list of all available configuration files, and display a particular configuration file by providing the filename.
<b>Options</b>	<p>copy—Copy configuration files.</p> <p>delete—Delete the configuration files.</p> <p>list—Generate a list of all available files.</p> <p>rename—Rename a file.</p> <p>show—Display a particular configuration file.</p>
<b>Additional Information</b>	See “Performing CLI File Operations” on page 39.
<b>Required Privilege Level</b>	maintenance

## help

---

<b>Syntax</b>	help
<b>Release Information</b>	Command introduced in BXOS Release 3.0.
<b>Description</b>	Generate a list of all operational mode commands and their functions.
<b>Additional Information</b>	See “Using CLI Help” on page 17 and “Getting Help for Commands” on page 13.
<b>Required Privilege Level</b>	none

## history

---

<b>Syntax</b>	history
<b>Release Information</b>	Command introduced in BXOS Release 3.0.
<b>Description</b>	Display a list of last 125 commands executed.
<b>Additional Information</b>	See “Displaying the Command History” on page 17.
<b>Required Privilege Level</b>	view

## monitor

---

**Syntax** monitor (start | stop) *file-name*

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Monitor the system files.

**Options** start—Start the monitoring process.  
 stop—Stop monitoring process.  
*file-name*—Name of the system file to be monitored.

**Additional Information** See “CLI Command Categories” on page 23.

## ping

---

**Syntax** ping  
 <c | i | -t | -l>  
*ip-address*

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Determine the reachability of a remote network host.

**Options** *ip-address*—IP address of a remote machine for which you want to check the reachability network path.  
 -c—(Optional) Count the number of times the system pings.  
 -i—(Optional) Time interval for sending the ping messages.  
 -t—(Optional) Time to live (TTL) which describes how long the packet is active.  
 -l—(Optional) Interface or address.

**Additional Information** See “CLI Command Categories” on page 23.

**Required Privilege Level** view and maintenance

## ping-mpls

---

**Syntax** ping-mpls rsvp *tunnel-name*  
 <count *count*>  
 <detail>  
 <send-interval *interval*>  
 <source-address *ip-address*>  
 <destination-address *ip-address*>

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Determine the reachability of a remote network host over MPLS and ping the remote target over MPLS.

**Options** *tunnel-name*—Name of the tunnel configured over RSVP.  
*count*— (Optional) Display the counter value.  
*detail*—(Optional) Display the detailed connectivity information.  
*interval*—(Optional) Time taken, in milliseconds, to send the data between two nodes.  
*ip-address*—(Optional) Source or destination IP address of a remote machine for which you want to check the network path over MPLS.

**Additional Information** See the *BXOS Configuration Guide*.

**Required Privilege Level** network connection

## request system reboot

---

**Syntax** request system reboot

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Restart the gateway and clear all committed and uncommitted commands.

**Options** reboot—Request for the rebooting of system.

**Additional Information** See “Commonly Used Operational Mode Commands” on page 24.

**Required Privilege Level** restart

## set

---

<b>Syntax</b>	set
<b>Release Information</b>	Command introduced in BXOS Release 3.0.
<b>Description</b>	Set the CLI prompt, banner, and hostname.
<b>Additional Information</b>	See “Summary of CLI Environmental Mode Commands” on page 113.
<b>Required Privilege Level</b>	configuration

## show

---

<b>Syntax</b>	show (arp   atm-cross-connect   atm-traffic-profiles   ba-classifiers   bfd-global   bfd-session   bypass   chassis   cli   configuration   date   exception   interface   ip   isis   l2circuit   ldp   log   mac-filter   manual-mode   memory   mf-classifiers   mpls   ntp   ospf   policy   ports   protocols   qos-profiles   qos-scheduler   qos-shaper   qos-statistics   radius-server   route   rsvp   snmp   statistics   system   tacplus-server   version   zerotouch)
<b>Release Information</b>	Command introduced in BXOS Release 3.0.
<b>Description</b>	Display the information about all software aspects and protocols.
<b>Options</b>	<p>arp—Display the details for the Address Resolution Protocol (ARP).</p> <p>atm-cross-connect—Display the details for ATM cross-connect commands.</p> <p>atm-traffic-profiles—Display information about the configured ATM traffic profiles.</p> <p>ba-classifiers—Display the behavioral aggregate classifier information.</p> <p>bfd-global—Display the Bidirectional Forwarding Detection (BFD) global information.</p> <p>bfd-session—Display the BFD session details.</p> <p>bypass—Display the bypass tunnel information.</p> <p>chassis—Display the chassis information.</p> <p>cli—Display information about the current CLI environment in which you are working.</p> <p>configuration—Display the current configuration.</p> <p>date—Display the current date and time of the system.</p> <p>exception—Display the exception details.</p> <p>interface—Display the interface details.</p> <p>ip—Display the IP details for the gateway.</p>

`isis`—Display the IS-IS parameters.

`l2circuit`—Display the status information about Layer 2 virtual circuits (VCs).

`ldp`—Display the Label Distribution Protocol (LDP) parameters.

`log`—Display the system log information.

`mac-filter`—Display the details for Media Access Control (MAC) filters.

`manual-mode`—Display the manual mode.

`memory`—Display the memory counters that the gateway uses.

`mf-classifiers`—Display multifield classifier information.

`mpls`—Display the MPLS details.

`ntp`—Display the Network Time Protocol (NTP) details.

`ospf`—Display the details for the OSPF protocol.

`policy`—Display information about the configured routing policies.

`ports`—Display ports.

`protocols`—Display the configured protocols.

`qos-profile`—Display quality-of-service (QoS) profile information.

`qos-scheduler`—Display QoS scheduler information.

`qos-shaper`—Display QoS shaper information.

`qos-statistics`—Display the QoS statistics information.

`radius-server`—Display the details for RADIUS server configuration parameters.

`route`—Display the gateway details.

`rsvp`—Display the RSVP parameters.

`snmp`—Display SNMP information.

`statistics`—Display the protocol statistics.

`system`—Display the counter that the system uses.

`tacplus-server`—Display the details for TACACS+ server configuration parameters.

`version`—Display the current CLI version.

`zerotouch`—Display the zerotouch mode.

**Additional Information** See “Commonly Used Operational Mode Commands” on page 24 and “Summary of Show Commands” on page 43.

**Required Privilege Level** Depends on the specific command.

## ssh

---

**Syntax** ssh  
 <*b addr* | -D *port* | -e *char* | -L *listen-port:host:port* | -l *user* | -p *port*>

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Display the secure shell settings. SSH client is a program for logging in to a remote machine and for executing commands on a remote machine.

**Options** -b *addr*—(Optional) Specifies a local IP address.  
 -D *port*—(Optional) Enables dynamic application-level port forwarding.  
 -e *char*—(Optional) Sets the escape character; “none” = disable. The default is ~.  
 -L *listen-port:host:port*—(Optional) Forwards the local port to a remote address.  
 -l *user*—(Optional) Logs in using the username.  
 -p *port*—(Optional) Connects to the specified port. The server is on the same port.

**Additional Information** See “Commonly Used Operational Mode Commands” on page 24.

**Required Privilege Level** configuration

## traceroute

---

**Syntax** traceroute *ip-address*  
 <-g | -p | -s | -t | -w>

**Release Information** Command introduced in BXOS Release 3.0.

**Description** Trace a route to a remote network host.

**Options** -g—(Optional) Trace the route for a gateway.  
 -p—(Optional) Trace the route for a port.  
 -s—(Optional) Source address from which the connection is established.  
 -t—(Optional) Type of service (ToS).  
 -w—(Optional) Wait time in establishing the connection.  
*ip-address*—IP address of the remote host.

**Additional Information** See “CLI Command Categories” on page 23.

**Required Privilege Level** network connection



## Chapter 9

# Summary of CLI Configuration Mode Statements

This chapter presents the configuration mode statements available in the BX operating system (BXOS) software. Use the configuration statements to configure the gateway. You can create hierarchy of configuration statements to configure interfaces, ports, protocols, tunnels, pseudowires, and hardware properties. Statements are listed in alphabetical order.

Table 26 on page 127 summarizes the command-line interface (CLI) configuration mode statements.

**Table 26: BXOS Configuration Mode Statements**

Task	Command
Execute and implement the configuration.	commit on page 128
Enter various hierarchies.	edit on page 128
Debug the internetworking problems.	debug on page 129
Delete gateway configuration parameters.	delete on page 129
Quit configuration mode.	exit on page 129
Load the configuration to a file.	load on page 130
Lock the configuration mode.	lock on page 130
Restart the IMA interface.	restart ima-group on page 130
Save the configuration to a file.	save on page 131
Set the system settings.	set on page 131
Move to the uppermost level in hierarchy.	top on page 131
Unlock the configuration mode.	unlock on page 131
Move one level up in the hierarchy.	up on page 132

## commit

---

<b>Syntax</b>	commit
<b>Release Information</b>	Statement introduced in BXOS Release 3.0.
<b>Description</b>	Execute the commands and implement the configuration. Use this command to configure the settings for interfaces, protocols, and other system-related functions.
<b>Additional Information</b>	See “Committing a Configuration” on page 37.
<b>Required Privilege Level</b>	configuration

## edit

---

<b>Syntax</b>	edit (atm-profile   chassis   connection   interface   policy-options   protocol   rmon   static-route   syslog   system)
<b>Release Information</b>	Command introduced in BXOS Release 3.0.
<b>Description</b>	Move to a particular hierarchy level. If the hierarchy level does not exist, the edit command creates it and then moves to it.
<b>Options</b>	<p>atm-profile—Configure the ATM interface profile.</p> <p>chassis—Configure the chassis properties.</p> <p>connection—Configure the cross-connection between two links.</p> <p>interface—Configure the BX 7000 multi-access gateway interface, which includes T1 or E1, Gigabit, GRE interface, ML-PPP interface, and IMA interface.</p> <p>policy-options—Configure the routing policy options for the gateway.</p> <p>protocol—Configure the protocol, which includes BFD, IS-IS, LDP, MPLS, OSPF, PPP, RSVP, SNMP, and SNMPv3.</p> <p>rmon—Configure the Remote Monitoring (RMON) details, which enables the network monitor and console systems to exchange network monitoring data.</p> <p>static-route—Configure the static route details.</p> <p>syslog—Configure the system log details.</p> <p>system—Configure the system details.</p>
<b>Additional Information</b>	See “CLI Command Categories” on page 23 , “Editing a Configuration” on page 38, and “Configuration Statements and Identifiers” on page 31
<b>Required Privilege Level</b>	configuration

**debug**

---

<b>Syntax</b>	debug (atm-ima <i>interface-name</i>   ips-trace (filter-in   filter-out) ( nbase   cust   stubs   sm   ahl   lmgr   rsvp   ldp   mpls   temb   cpr   ospf   isis   rsm   pim)   pd-trace (none   audit   problem   exceptions))
<b>Release Information</b>	Statement introduced in BXOS Release 3.0.
<b>Description</b>	Diagnose and resolve internetworking problems. This command provides real-time debugging of software components for troubleshooting a specific problem.
<b>Options</b>	atm-ima—Display Inverse Multiplexing over ATM (IMA) debug messages.  ips-trace—Debug the ips-trace parameters.  pd-trace—Debug on the basis of pd-trace parameter. The parameter can be none, audit, problem, and exceptions.
<b>Required Privilege Level</b>	maintenance

**delete**

---

<b>Syntax</b>	delete (interface   protocol   syslog)
<b>Release Information</b>	Statement introduced in BXOS Release 3.0.
<b>Description</b>	Delete the gateway configuration parameters.
<b>Options</b>	interface—Delete the configured interface.  protocol—Delete the specified protocol.  syslog—Delete the archive, console, file, host, and user properties.
<b>Additional Information</b>	See “Deleting a Configuration” on page 38.
<b>Required Privilege Level</b>	shell and maintenance

**exit**

---

<b>Syntax</b>	exit
<b>Release Information</b>	Statement introduced in BXOS Release 3.0.
<b>Description</b>	Quit the configuration mode.
<b>Additional Information</b>	See “CLI Command Categories” on page 23.
<b>Required Privilege Level</b>	shell and maintenance

## load

---

<b>Syntax</b>	load <i>file-name</i>
<b>Release Information</b>	Statement introduced in BXOS Release 3.0.
<b>Description</b>	Load the recently executed commands and configurations to a configuration file.
<b>Options</b>	<i>file-name</i> —Name of the source file from where all the currently executed commands, statements, and configurations are loaded.
<b>Additional Information</b>	See “Saving and Loading a Configuration File” on page 37.
<b>Required Privilege Level</b>	configuration

## lock

---

<b>Syntax</b>	lock
<b>Release Information</b>	Statement introduced in BXOS Release 3.0.
<b>Description</b>	Lock the configuration mode from committing any configuration commands, statements, and settings.
<b>Additional Information</b>	See “CLI Configuration Mode Commands” on page 29.
<b>Required Privilege Level</b>	shell and maintenance

## request system snapshot

---

<b>Syntax</b>	request system snapshot
<b>Release Information</b>	Statement introduced in BXOS Release 3.0.
<b>Description</b>	Display the snapshot of primary image.
<b>Required Privilege Level</b>	maintenance

## restart ima-group

---

<b>Syntax</b>	restart ima-group <i>interface-name</i>
<b>Release Information</b>	Statement introduced in BXOS Release 3.0.
<b>Description</b>	Restart the IMA interface.
<b>Options</b>	<i>interface-name</i> —Name of an IMA interface.
<b>Additional Information</b>	See “Commonly Used Operational Mode Commands” on page 24.
<b>Required Privilege Level</b>	maintenance

**save**

---

<b>Syntax</b>	save (commands   configuration)
<b>Release Information</b>	Statement introduced in BXOS Release 3.0.
<b>Description</b>	Save the currently executed configuration commands and statements to a configuration file, and save the <code>running.xml</code> to <code>startup.cfg</code> . This persists from the configuration across reboot.
<b>Options</b>	<p>commands—Save the configuration commands to a file.</p> <p>configuration—Save the current configuration as startup configuration.</p>
<b>Additional Information</b>	See “Saving and Loading a Configuration File” on page 37.
<b>Required Privilege Level</b>	configuration

**set**

---

<b>Syntax</b>	set (cli   date   framer-mode)
<b>Release Information</b>	Statement introduced in BXOS Release 3.0.
<b>Description</b>	Configure the settings for the interfaces, protocols, and other system properties.
<b>Options</b>	<p>cli—Set the CLI settings, including the CLI prompt and banner.</p> <p>date—Set the current date for the system.</p> <p>framer-mode—Set the framer mode settings as either T1 or E1.</p>
<b>Required Privilege Level</b>	configuration

**top**

---

<b>Syntax</b>	top
<b>Release Information</b>	Statement introduced in BXOS Release 3.0.
<b>Description</b>	Move to the uppermost level in the hierarchy. Also used to exit from the series of hierarchical statements.
<b>Additional Information</b>	See “Moving Among Hierarchy Levels” on page 12.
<b>Required Privilege Level</b>	view

**unlock**

---

<b>Syntax</b>	unlock
<b>Release Information</b>	Statement introduced in BXOS Release 3.0.

**Description** Remove the lock from configuration mode.

**Additional Information** See “CLI Configuration Mode Commands” on page 29.

**Required Privilege Level** shell and maintenance

## **up**

---

**Syntax** up

**Release Information** Statement introduced in BXOS Release 3.0.

**Description** Move one level up in the hierarchy.

**Additional Information** See “Moving Among Hierarchy Levels” on page 12.

**Required Privilege Level** view

## Part 4

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