Using the Command-Line Interface

This chapter provides helpful tips for understanding and configuring the Cisco Prime Infrastructure from the command-line interface (CLI). The Cisco Prime Infrastructure can be deployed for small, medium, and large deployments and is available on different platforms and also as a software that can run on VMware. This section contains the following topics:

- Before Accessing the Cisco Prime Infrastructure CLI, page 1
- Running the Setup Utility to Configure the Cisco Prime Infrastructure, page 1
- Accessing the Cisco Prime Infrastructure CLI, page 3
- Understanding Command Modes, page 7
- Navigating the CLI Commands, page 12
- Where to Go Next, page 18

Before Accessing the Cisco Prime Infrastructure CLI

Before logging in to the Cisco Prime Infrastructure CLI, ensure that you have completed the installation tasks as specified in the Cisco Prime Network Control System Hardware Installation Guide, Release 1.0.

Running the Setup Utility to Configure the Cisco Prime Infrastructure

When you power up the Cisco Prime Infrastructure appliances for the first time, you are prompted to run the setup utility to configure the Cisco Prime Infrastructure appliances. Before you run the utility using the setup command, ensure that you have values for the following network configuration prompts:

- Hostname
- IP address
- Netmask
- Gateway
• Domain
• Nameserver
• Network Time Protocol (NTP) server (optional)
• User ID
• Password

This example shows sample output of the `setup` command:

```
**********************************************
Please type 'setup' to configure the appliance
**********************************************
localhost login: setup
Press 'Ctrl-C' to abort setup
Enter hostname[]: NCS
Enter IP address[]: 172.16.90.183
Enter IP default netmask[]: 255.255.255.0
Enter IP default gateway[]: 172.16.90.1
Enter default DNS domain[]: example.com
Enter primary nameserver[]: 172.16.168.183
Add/Edit another nameserver? Y/N : n
Enter primary NTP server[time.nist.gov]:
Add/Edit secondary NTP server? Y/N : n
Enter username[admin]:
Enter password:
Enter password again:
Bringing up network interface...
Pinging the gateway...
Pinging the primary nameserver...
Do not use 'Ctrl-C' from this point on...
Appliance is configured
```

After you enter the required information, the Cisco Prime Infrastructure appliance automatically reboots and the following login prompt appears:

```
machine_name login:
```

where `machine_name` identifies the hostname that you specified when you ran the `setup` command.

In this example, this prompt appears:

```
NCS login:
```

To log in, use the administrator user account (and the corresponding password) that you created during the setup process. You must also use this Admin account to log in to the Cisco Prime Infrastructure CLI for the first time. After accessing the CLI as an administrator, you can create more users (with admin and operator privileges) with SSH access to the CLI by running the `username` command in configuration mode.

---

**Note**

The administrator user account and the corresponding password (a CLI user account) that you created during the initial setup wizard can be used to manage the Cisco Prime Infrastructure application using the CLI. The CLI user has privileges to start and stop the Cisco Prime Infrastructure application software, backup and restore the Cisco Prime Infrastructure application data, apply software patches and upgrades to the Cisco Prime Infrastructure application software, view all the system and the application logs, and reload or shutdown the Cisco Prime Infrastructure appliance. To protect the CLI user credentials, explicitly create users with access to the CLI.
Accessing the Cisco Prime Infrastructure CLI

Before logging in to the Cisco Prime Infrastructure CLI, ensure that you have completed the hardware installation and configuration process outlined in the "Before Accessing the Cisco Prime Infrastructure CLI" section.

To log in to the Cisco Prime Infrastructure server and access the CLI, use an SSH secure shell client or the console port. You can log in from:

- A PC running Windows XP/Vista.
- A PC running Linux.
- An Apple computer running Mac OS X 10.4 or later.
- Any terminal device compatible with VT100 or ANSI characteristics. On the VT100-type and ANSI devices, you can use cursor-control and cursor-movement key. Keys include left arrow, up arrow, down arrow, right arrow, Delete, and Backspace. The CLI senses the use of the cursor-control keys and automatically uses the optimal device characteristics.

To exit the CLI, use the `exit` command from EXEC mode. You are currently in one of the configuration modes and you want to exit the CLI, enter the `end`, `exit`, or `Ctrl-z` command to return to EXEC mode, and then enter the `exit` command.

Supported Hardware and Software Platforms

The following valid terminal types can access the Cisco Prime Infrastructure:

- 1178
- 2621
- 5051
- 6053
- 8510
- altos5
- amiga
- ansi
- apollo
- Apple_Terminal
Opening the CLI with Secure Shell

To access the Cisco Prime Infrastructure CLI environment, use any SSH client that supports SSH v2.

The following example shows you how to log in with a Secure Shell (SSH) client (connecting to a wired WAN) via a PC by using Windows XP. Assuming that Cisco Prime Infrastructure is preconfigured through the setup utility to accept an Admin (administrator) user, log in as Admin.

**SUMMARY STEPS**

1. Use any SSH client and start an SSH session.
2. Press Enter or Spacebar to connect.
3. Enter a hostname, username, port number, and authentication method.
4. Click Connect, or press Enter.
5. Enter your assigned password for the administrator.
6. (Optional) Enter a profile name in the text box and click Add to Profile.
7. Click Close on the Add Profile window.

**DETAILED STEPS**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>Use any SSH client and start an SSH session. The SSH window appears.</td>
</tr>
<tr>
<td>Step 2</td>
<td>Press Enter or Spacebar to connect. The Connect to Remote Host window appears.</td>
</tr>
<tr>
<td>Step 3</td>
<td>Enter a hostname, username, port number, and authentication method. In this example, you enter ncs for the hostname, admin for the username, and 22 for the port number; and, for the authentication method, choose Password from the drop-down list.</td>
</tr>
<tr>
<td>Step 4</td>
<td>Click Connect, or press Enter. The Enter Password window appears.</td>
</tr>
<tr>
<td>Step 5</td>
<td>Enter your assigned password for the administrator. The SSH with the Add Profile window appears.</td>
</tr>
<tr>
<td>Step 6</td>
<td>(Optional) Enter a profile name in the text box and click Add to Profile.</td>
</tr>
</tbody>
</table>
Opening the CLI Using a Local PC

If you need to configure NCS locally (without connecting to a wired LAN), you can connect a PC to the console port on the Cisco Prime Infrastructure appliance by using a null-modem cable.

The serial console connector (port) provides access to the CLI locally by connecting a terminal to the console port. The terminal is a PC running terminal-emulation software or an ASCII terminal. The console port (EIA/TIA-232 asynchronous) requires only a null-modem cable.

To connect a PC running terminal-emulation software to the console port, use a DB-9 female to DB-9 female null-modem cable.

To connect an ASCII terminal to the console port, use a DB-9 female to DB-25 male straight-through cable with a DB-25 female to DB-25 female gender changer.

The default parameters for the console port are 9600 baud, 8 data bits, no parity, 1 stop bit, and no hardware flow control.

**Note**

If you are using a Cisco switch on the other side of the connection, set the switchport to duplex auto, speed auto (the default).

To connect to the console port and open the CLI, complete the following steps:

**SUMMARY STEPS**

1. Connect a null-modem cable to the console port on the Cisco ISE-3315 and to the COM port on your PC.
2. Set up a terminal emulator to communicate with the Cisco Prime Infrastructure. Use the following settings for the terminal emulator connection: 9600 baud, 8 data bits, no parity, 1 stop bit, and no flow control.
3. When the terminal emulator activates, press **Enter**.
4. At the window, enter your username, then press **Enter**.
5. Enter the password, then press **Enter**.

**DETAILED STEPS**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>Connect a null-modem cable to the console port on the Cisco ISE-3315 and to the COM port on your PC.</td>
</tr>
<tr>
<td>Command or Action</td>
<td>Purpose</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>Set up a terminal emulator to communicate with the Cisco Prime Infrastructure. Use the following settings for the terminal emulator connection: 9600 baud, 8 data bits, no parity, 1 stop bit, and no flow control.</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>When the terminal emulator activates, press Enter.</td>
</tr>
<tr>
<td><strong>Step 4</strong></td>
<td>At the window, enter your username, then press Enter.</td>
</tr>
<tr>
<td><strong>Step 5</strong></td>
<td>Enter the password, then press Enter.</td>
</tr>
<tr>
<td></td>
<td>When the CLI activates, you can enter CLI commands to configure the Cisco Prime Infrastructure.</td>
</tr>
</tbody>
</table>
Understanding Command Modes

This section describes the Cisco Prime Infrastructure command modes in detail. This section contains the following topics:

- EXEC Mode
- Configuration Mode
- Configuration Submodes
EXEC Mode

When you start a session on the Cisco Prime Infrastructure, you begin in admin or EXEC mode. From EXEC mode, you can enter configuration mode. Most of the EXEC commands (one-time commands), such as show commands, display the current configuration status. The admin or EXEC mode prompt consists of the device name or hostname before a pound sign (#), as shown:

ncs/admin# (Admin or EXEC mode)

Note
Throughout this guide, the Cisco Prime Infrastructure server uses the name ncs in place of the hostname and admin of the Cisco Prime Infrastructure server for the user account.

You can always tell when you are in EXEC mode or configuration mode by looking at the prompt.

• In EXEC mode, a pound sign (#) appears after the NCS server hostname and your username.
  For example:
  
  ncs/admin#

• In configuration mode, the ‘config’ keyword and a pound sign (#) appear after the hostname of the Cisco Prime Infrastructure server and your username.
  For example:

  ncs/admin# configure
  Enter configuration commands, one per line. End with CNTL/Z.
  ncs/admin(config)# (configuration mode)

If you are familiar with UNIX, you can equate EXEC mode to root access. You could also equate it to the administrator level in Windows NT or the supervisor in NetWare. In this mode, you have permission to access everything in the Cisco Prime Infrastructure server, including the configuration commands. However, you cannot enter configuration commands directly. Before you can change the actual configuration of the Cisco Prime Infrastructure server, you must enter configuration mode by entering the configure or configure terminal (conf t) command. Enter this command only when in EXEC mode.

For example:

ncs/admin# conf t
Enter configuration commands, one per line. End with CNTL-Z.
ncs(config)# (configuration mode)

The configuration mode has several submodes; each has its own prompt. To enter these submodes, you must first enter configuration mode by entering the configure terminal command.

To exit configuration mode, enter the end, exit, or Ctrl-z command. To exit EXEC mode, enter the exit command. To exit both configuration and EXEC modes, enter this sequence of commands:

ncs/admin(config)# exit
ncs/admin# exit

To obtain a listing of commands in EXEC mode, enter a question mark (?):

ncs/admin# ?
Configuration Mode

Use configuration mode to make changes to the existing configuration. When you save the configuration, these commands remain across Cisco Prime Infrastructure server reboots, but only if you run either of these commands:

- `copy running-config startup-config`
- `write memory`

To enter configuration mode, run the `configure` or `configure terminal (conf t)` command in EXEC mode. When in configuration mode, the Cisco Prime Infrastructure expects configuration commands.

For example:

```
ncs/admin# configure
Enter configuration commands, one per line. End with CNTL-Z.
ncs/admin(config)# (configuration mode)
```

From this level, you can enter commands directly into the Cisco Prime Infrastructure configuration. To obtain a listing of commands in this mode, enter a question mark (`?`):

```
ncs/admin(config)# ?
```

The configuration mode has several configuration submodes. Each of these submodes places you deeper in the prompt hierarchy. When you enter `exit`, the Cisco Prime Infrastructure backs you out one level and returns you to the previous level. When you enter `exit` again, the Cisco Prime Infrastructure backs you out to the EXEC level.

**Note**

In configuration mode, you can alternatively enter `Ctrl-z` instead of the `end` or `exit` command.
Configuration Submodes

In the configuration submodes, you can enter commands for specific configurations. For example:

```plaintext
ncs/admin# config t
ncs/admin(config)# interface GigabitEthernet 0
ncs/admin(config-GigabitEthernet)#
```

To obtain a list of commands in this mode, enter a question mark (?):

```plaintext
ncs/admin(config-GigabitEthernet)# ?
```

Use the `exit` or `end` command to exit this prompt and return to the configuration prompt.

The below table lists the commands in the interface GigabitEthernet 0 configuration submode. Other configuration submodes exist including those specific to the `kron`, `repository`, and `password policy` commands.
Table 1: Command Options in the Interface GigabitEthernet 0 Configuration Submode (continued)

<table>
<thead>
<tr>
<th>Comment</th>
<th>Command</th>
</tr>
</thead>
</table>
| Enter the command that you want to configure for the interface. This example uses the `interface GigabitEthernet` command. Enter `?` to display what you must enter next on the command line. This example shows the available `interface GigabitEthernet` configuration submode commands. | ncs/admin(config)# interface GigabitEthernet 0  
ncs/admin(config-GigabitEthernet)# ?  
Configure ethernet interface:  
do EXEC command  
end Exit from configure mode  
exit Exit from this submode  
ip Configure IP features  
ipv6 Configure IPv6 features  
no Negate a command or set its defaults  
shutdown Shutdown the interface |
| Enter the command that you want to configure for the interface. This example uses the `ip` command. Enter `?` to display what you must enter next on the command line. This example shows the available `ip` configuration submode commands. | ncs/admin(config-GigabitEthernet)# ip ?  
address Configure IP address |
| Enter the command that you want to configure for the interface. This example uses the `ip address` command. Enter `?` to display what you must enter next on the command line. In this example, you must enter an IPv4 address. A carriage return `<cr>` does not appear; therefore, you must enter additional arguments to complete the command. | ncs/admin(config-GigabitEthernet)# ip address  
ncs/admin(config-GigabitEthernet)# ip ?  
<A.B.C.D> IPv4 address  
ncs/admin(config-GigabitEthernet) ip address  |
| Enter the keyword or argument that you want to use. This example uses the 172.16.0.1 IP address. Enter `?` to display what you must enter next on the command line. In this example, you must enter a network mask. A carriage return `<cr>` does not display; therefore, you must enter additional arguments to complete the command. | ncs/admin(config-GigabitEthernet)# ip address 172.16.0.1 ?  
<A.B.C.D> Network mask  
ncs/admin(config-GigabitEthernet) ip address 172.16.0.1 |
| Enter the network mask. This example uses the 255.255.255.224 IP address. Enter `?` to display what you must enter next on the command line. In this example, you can press Enter. A carriage return `<cr>` displays; you can press Enter to complete the command. | ncs/admin(config-GigabitEthernet)# ip address 172.16.0.1 255.255.255.224 ?  
<cr> Carriage Return  
ncs/admin(config-GigabitEthernet)# ip address 172.16.0.1 255.255.255.224 |
Navigating the CLI Commands

This section describes how to navigate the commands and modes on the Cisco Prime Infrastructure and contains the following topics:

- Getting Help
- Using the No and Default Forms of Commands
- Command Line Conventions
Getting Help

Use the question mark (?) and the arrow keys to help you enter commands:

- For a list of available commands, enter a question mark (?):

  ncs/admin# ?

- To complete a command, enter a few known characters before ? (with no space):

  ncs/admin# s?

- To display keywords and arguments for a command, enter ? at the prompt or after entering part of a command followed by a space:

  ncs/admin# show ?

  The Cisco NCS displays a list and brief description of available keywords and arguments.

---

**Note**

The <cr> symbol in command help stands for “carriage return”, which means to press the Return or the Enter key). The <cr> at the end of command help output indicates that you have the option to press Enter to complete the command and that the arguments and keywords in the list preceding the <cr> symbol are optional. The <cr> symbol by itself indicates that no more arguments or keywords are available, and that you must press Enter to complete the command.

- To redisplay a command that you previously entered, press the Up Arrow key. Continue to press the Up Arrow key to see more commands.
Using the No and Default Forms of Commands

Some EXEC or configuration commands have a no form. In general, use the no form to disable a function. Use the command without the no keyword to re-enable a disabled function or to enable a function disabled by default; for example, an IP address enabled by default. To disable the IP address, use the no ip address command; to re-enable the IP address, use the ip address command.

Configuration commands can also have a default form, which returns the command settings to the default values. Most commands disable by default, so in such cases using the default form has the same result as using the no form of the command. However, some commands are enabled by default and have variables set to certain default values. In these cases, the default form of the command enables the command and sets the variables to their default values.

See Appendix A, Cisco Prime Infrastructure Command Reference for a description of the complete syntax of the configuration commands, and the no and default forms of a command.
Command Line Conventions

This section contains some basic command-line convention and operation information that is essential to the use of this guide. This section contains the following topics:

- Command Line Editing Key Conventions
- Command Line Completion
- Continuing Output at the --More-- Prompt
Command Line Editing Key Conventions

The Cisco Prime Infrastructure provides a number of keyboard shortcuts that you can use to edit an entered line.

**Tab**
Press **Tab** to try to finish the current command.

If you press the **Tab** key:

- At the beginning of a line, the system lists all the short-form options.
- When you enter a partial command, the system lists all the short form options beginning with those characters.
- When only one possible option is available, the system fills in the option automatically.

**Ctrl-c**
Press **Ctrl-c** to abort the sequence. Pressing this key sequence breaks out of any executing command and returns to the previous mode.

**Ctrl-z**
Press **Ctrl-z** to exit configuration mode and return to previous configuration mode.

**?**
Enter a question mark (?) at the prompt to list the available commands.
Command Line Completion

Command-line completion makes the Cisco Prime Infrastructure CLI more user-friendly. It saves you extra key strokes and helps out when you cannot remember the syntax of a command.

For example, for the `show running-config` command:

```
ncs/admin# show running-config
```

You can:

```
ncs/admin# sh run
```

The Cisco Prime Infrastructure expands the command `sh run` to `show running-config`.

Another shortcut is to press the Tab key after you type `sh`; the Cisco Prime Infrastructure CLI fills in the rest of the command, in this case `show`.

If the Cisco Prime Infrastructure CLI does not understand a command, it repeats the entire command line and places a caret symbol (^) under the point at which it is unable to parse the command.

For example:

```
ncs/admin# show unning-configuration
```

The caret symbol (^) points to the first letter in the command line that the Cisco Prime Infrastructure does not understand. Usually, this means that you need to provide additional arguments to complete the command or you mispelled the command. In this case, you omitted the "r" in the "unning" command. To fix the error, retype the command.

In another form of command-line completion, you can start a command by entering the first few characters, then pressing the Tab key. As long as you can match one command, the Cisco Prime Infrastructure CLI will complete the command. For example, if you type `sh` and press Tab, the Cisco Prime Infrastructure completes the `sh` with `show`. If NCS does not complete the command, you can enter a few more letters and press Tab again. For more information, see Tab.
Continuing Output at the --More-- Prompt

When working with the Cisco Prime Infrastructure CLI, output often extends beyond the visible screen length. For cases where output continues beyond the bottom of the screen, such as with the output of many `?` or `show` commands, the output pauses and a --More-- prompt appears at the bottom of the screen. To resume output, press Return to scroll down one line, or press the spacebar to display the next full screen of output.

Tip If the output pauses on your screen but you do not see the --More-- prompt, try entering a smaller value for the screen length by using the `terminal length` EXEC command. Command output will not pause if you set the length value to zero (0).

Where to Go Next

Now that you are familiar with some of the Cisco Prime Infrastructure CLI basics, you can begin to configure the Cisco Prime Infrastructure by using the CLI.

Remember that:

- You can use the question mark (?) and arrow keys to help you enter commands.
- Each command mode restricts you to a set of commands. If you have difficulty entering a command, check the prompt and then enter the question mark (?) to see a list of available commands.
- To disable a feature, enter the keyword `no` before the command; for example, `no ip address`.
- You must save your configuration changes so that you preserve them during a system reload or power outage.

Proceed to Appendix A, "Cisco Prime Infrastructure" Command Reference" for command listings, descriptions, syntax, usage guidelines, and sample output.