Boson ®

ICND1
Lab Guide

100-105

Interconnecting Cisco Networking Devices Part 1
Version 3.0

Labs powered by

NetSim ®
NETWORK SIMULATOR ®

Interconnecting Cisco Networking Devices Part 1

100-105 Lab Guide

Boson® NetSim®
NETWORK SIMULATOR®

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To perform the labs referenced in this book, please download and install the necessary files (refer to your purchase receipt for the download link), navigate to the appropriate lab in the lab menu in the Boson NetSim, and load the lab; all labs should work in NetSim 9 or later. To learn more about the Boson NetSim or to purchase and download the software, please visit www.boson.com/netsim.

A couple sample labs are included in this document to display the quality, format, and content of labs that are included in the Boson NetSim and the Boson Courseware products. However, you will not be able to work through the labs in NetSim without purchasing both Boson NetSim and the Boson ICND1 Courseware Lab Pack.

Please visit www.boson.com for more information.

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Boson NetSim Overview

The Boson NetSim® Network Simulator®, which includes the Boson Router Simulator®, is unique compared to all others on the market because of the functionality it supports and its features. NetSim utilizes Boson's proprietary Network Simulator, Router Simulator®, and EROUTER® software technologies, along with the Boson Virtual Packet Technology® engine, to create individual packets. These packets are routed and switched through the simulated network, allowing NetSim to build an appropriate virtual routing table and simulate true networking. Other simulation products on the market do not support this level of functionality.

NetSim is a Windows®-based product that simulates a wide variety of Cisco® routers, including the 2500 series, 2600 series, 2800 series, and 3600 series routers, as well as the Cisco Catalyst 1900 series, 2900 series, and 3500 series switches. NetSim supports multiple routing protocols, including RIP, IGRP, EIGRP, BGP, and OSPF. It supports different LAN/WAN protocols, including PPP/CHAP, ISDN, and Frame Relay. The labs in NetSim require only the devices and functionality included with NetSim—they do not require access to any external router or switch hardware. NetSim supports many, but not all, of the IOS commands available on a physical router or switch. All the commands referenced in the available labs are supported by NetSim. The labs included in this book have been selected as companions to the Boson Curriculum. However, you can perform any labs that are unlocked for additional practice.

Achieving Cisco CCENT®, CCNA®, or CCNP® certification is the goal of many people who use this product. The Boson NetSim covers not only the SWITCH, TSHOOT, and ROUTE certifications but also the ICND1, ICND2, and CCNA certifications, among others. The included labs guide you through the configuration of routers, switches, and workstations in a variety of scenarios. Installed labs are made available (unlocked) depending on the activation key used to activate the product. All labs are downloaded and kept up to date after installation regardless of the activation key used.

Activation keys unlock labs and increase the number of available commands. Beginning with the Demo version of NetSim, the command set is limited to those necessary to perform the steps in the lab. For example, if you start your studies with a CCENT activation key, you will have the command set and labs available that are necessary to study for that exam. When you are ready to study for either the CCNA or CCNP exam, you will need to purchase a new activation key and then activate with the new CCNA or CCNP activation key; then, more labs and a larger command set become available.

A small lock icon (🔒) is displayed next to unavailable labs. Higher-level activation keys allow you to work through all labs unlocked by lower-level activation keys. All labs included with NetSim are unlocked when a CCNP-level activation key is used; courseware labs are unlocked with the appropriate activation key.

After you load and complete an unlocked lab, you can use the grading function in NetSim to grade the lab so that you can determine whether you completed it correctly (click **Lab** > **Grade Lab**). As you progress through the labs, you will master the skills needed to pass the simulation questions in the Cisco certification exams. NetSim has the ability to guide and grade, and using it for practice can actually be more helpful than using real routers and switches. NetSim allows you to gain experience without requiring you to purchase expensive equipment.

The Boson NetSim can be used for additional purposes other than only working through labs. The included full version of the **NetMap** tool allows you to practice designing and planning a network. This tool's functionality goes beyond that of most tools because, once you have created a network topology, you can actually create the router configurations that are going to be used, save those configurations, and practice using them on simulated devices.

Routing protocol implementation is one of the more challenging tasks you may encounter. Troubleshooting a production network can be a frustrating experience. Fortunately, you can create a virtual copy of your network topology by using the Boson NetMap and troubleshoot the problems *without interfering with your production network*. Although you can use NetSim as an aid in troubleshooting, you should not rely only on NetSim to make decisions about a production network, because NetSim is not designed to test real networks. Instead, it is a tool that you can use to study for Cisco certification.

In summary, Boson NetSim is a flexible and powerful product that can help you become certified and, in some cases, can be used to create a simulation of the topology of your corporate network and help you practice troubleshooting without using devices on the production network.

Using NetSim to Prepare for Your Certification

By incorporating NetSim as part of your process of achieving a Cisco certification, you can learn and master the skills necessary to help you successfully complete your certification track. The purpose of NetSim is to help you with the practical, hands-on portion of your education and to ensure that you not only understand the concepts of routing but can actually configure and implement routing on Cisco devices.

Mastering Cisco networking involves two fundamental tasks:

1. Learn the theory of routers and switches.
2. Gain the hands-on experience of implementing that theory by configuring the devices in a network and testing them in a lab.

Self-studying for a Cisco certification can be a daunting task. The amount of information a CCNA candidate is required to know and the skills that candidate is required to possess are quite extensive. To begin learning the theory of configuring a network, you can find a good reference book or listen to an instructor. But a reference book might not be enough. The book will not give you the practical, hands-on experience of routing and switching that you can learn from NetSim—experience that will help you build on the theoretical knowledge you learned from the reference book.

Real equipment gives you the ability to practice on actual routers and switches, but it also is a very costly way to practice and leaves a lot of room for error. The Boson NetSim, on the other hand, is an excellent tool to help you prepare for the CCNA (www.boson.com/certification/CCNA) and CCNP (www.boson.com/certification/CCNP) exams. NetSim simulates the behavior of a network and does not just return preprogrammed responses to expected command inputs. It allows you to create virtual packets and virtual frames that will be routed and switched through the simulated network. Aside from physically plugging in the cables and listening to the fan noise, your experience with the simulated network will be much the same as your experience with a fully functional lab rack without the expense of the hardware. NetSim will enable you to practice various configurations and master helpful skills.

Once you feel you have mastered the theory and the practical labs, you can test your knowledge by using the Boson ExSim-Max practice exam products available at the ExSim-Max home page (www.boson.com/exsim-max-practice-exams). Boson ExSim-Max practice exam products can include complex multiple-choice questions, drag-and-drop questions, Boson NetSimX simulation questions, and trouble tickets that simulate the questions you will see on the live exam.

Labs powered by **NetSim**

The Boson NetSim Network Simulator is the most comprehensive product on the market for learning how to configure a Cisco router. The Boson NetSim will not only help you become certified, it will actually help you learn and understand how to configure routers, switches, and networks.

For more information on how to use NetSim, please read the NetSim User Manual by clicking **Help** > **Users Manual** from within NetSim or by downloading the User Manual from the following link:

http://www.boson.com/Files/Support/NetSim-10-User-Manual.pdf

Using NetSim at Home – Single User

The following steps are for installation and activation for a single user license and should not be performed on a classroom workstation.

Downloading and Installing NetSim

You can download NetSim from the Boson.com downloads page (account required):

http://www.boson.com/download

You must have a Boson account to download the NetSim Demo. To create a free account, visit the Boson Online Account page (https://www.boson.com/account/default.aspx) and enter a valid e-mail address to begin creating an account.

You should download the NetSim installer to your computer before beginning the installation. It is recommended that you disable antivirus and firewall software while installing and activating NetSim and then reactivate when the installation is complete. Double-click the downloaded installation file to begin the installation, and perform the steps described in the prompts during installation.

Activating NetSim – Single User

When you first open NetSim, you will be presented with a **Product Activation** dialog box. Enter your e-mail address and password, and then click **Next**. On the next screen, select whether you want to activate NetSim in Online Mode (recommended method) or Offline Mode. Click **Next**. Then type the activation key; this information should be in the purchase receipt you received via e-mail, or you can find the receipt online on your Boson Online Account page (https://www.boson.com/account/default.aspx). If you are a student, you might receive this information from your learning institution or your instructor. You must have an active Internet connection in order to activate the full version of NetSim.

After a successful activation, the lab packs will be updated and NetSim will be ready for you to use. Installed labs are made available (unlocked) depending on the activation key used to activate the product. A small lock icon (🔒) is displayed next to unavailable labs. To make additional labs available, you will need to purchase a new activation key and then reactivate with the new activation key; then, more labs and a larger command set become available.

If you have not purchased an activation key for NetSim or if you received an activation key from your learning institution, you will not be able to activate the full version of NetSim on your personal computer. However, you can choose to continue in Demo mode. When you are running the Demo mode, only the demo lab and a limited set of commands are functional. To purchase the full version of NetSim, visit the About NetSim page (www.boson.com/support/netsim-support-topics) of the Boson website.

Loading a Lab
You can open NetSim from the shortcut installed during the download or from the Start menu by clicking **Boson Software** > **Boson NetSim** > **Boson NetSim**. If you are a student using NetSim at a learning institution, you should launch NetSim from the Start menu by clicking **Boson Software** > **Boson NetSim** > **Boson NetSim LS Client**. This will enable you to configure NetSim to authenticate with the Boson NetSim License Server.

1. You can begin a preloaded Boson NetSim lab by performing one of the following tasks:
   - On the navigation pane, click **Labs**; then, on the **Standard** tab of the **Labs** panel, double-click the lab you want to open.
   - Click to highlight a lab on the **Labs** pane, then click **Lab** > **Load lab**.
   - Select a lab from the list of **Recent Labs** or **Saved Labs** on the **Home** pane.
2. After you have loaded a lab, click the **Lab Instructions** tab and read through the lab instructions.
3. From the **Devices** drop-down menu on the **Consoles** section, select the device(s) that you need to configure in order to complete the lab and follow the steps in the lab. You can also select the device you want to configure by clicking the **NetMap** tab, right-clicking the device, and selecting **Configure in Simulator**.
4. When you have completed the lab, click **Lab** > **Grade Lab** to ensure that you have completed it successfully.
5. You can choose to save your single device configuration or multiple device configurations by selecting the appropriate option in the **File** menu.

You might also be instructed to open labs from a custom lab pack. If any custom labs are available, they will be on the **Custom** tab of the **Labs** pane. To open a custom lab, double-click the lab you want to load.

Accessing NetSim in the Classroom – Boson LS Client
If you are using NetSim in the classroom, it should already be installed on your classroom workstation. You should perform the following steps to configure NetSim to access the NetSim License Server.

As a student using NetSim at a learning institution, you should launch NetSim from the Start menu by clicking **Boson Software** > **Boson NetSim** > **Boson NetSim LS Client**. This will enable you to configure NetSim to authenticate with the Boson NetSim License Server.

Configuring NetSim to Authenticate with the Boson NetSim License Server
Note: Prior to using the Boson NetSim Client, you might need to associate your Boson.com account information with Boson NetSim. If you receive an activation key from your learning institution, activate Boson NetSim on your personal computer after creating a Boson.com account. Your network administrator/ instructor can then add you as an authorized user to the license server application. You may need to provide your learning institution with the e-mail address associated with your Boson.com account. You should not give your Boson.com account password to your instructor or learning institution. Your instructor will assign you a password that he or she has configured on the License Server, which you will need for step 3.

1. Run the Boson NetSim LS Client by clicking **Start** > **All Programs** > **Boson Software** > **Boson NetSim** > **Boson NetSim LS Client**.

2. In the **Boson NetSim - License Agreement** dialog box, select **Yes** to agree to the **Authorized User Agreement**. If you do not agree to the Authorized User Agreement, you will not be able to use the Boson NetSim client.

3. Your instructor will provide you with the settings you need to enter in the **Boson NetSim Client** dialog box. Enter the IP address (or computer name if the client computer and the license server are on a Windows-based network) and the port number of the computer running the NetSim License Server software. Enter the user name/password combination for authentication to the server. The user name will be the login information you used to establish an account with Boson.com, or the user name provided by your instructor. Enter the password assigned to you by your network administrator/instructor.

4. Select either **CCNA** or **CCNP** from the **Version** drop-down list; the version you select must match the version that is the current license type configured on the NetSim License Server.

5. Click **Connect**.

6. If a license is available on the license server, the **Continue** button will be enabled. Click the **Continue** button to start using the Boson NetSim.

For additional information on using Boson NetSim, please consult the Boson NetSim User Manual on Boson. com or click **Help** > **Users Manual**.

Loading a Lab

1. You can begin a preloaded Boson NetSim lab by performing one of the following tasks:

   • Expand the **Labs** panel; then, on the **Standard** tab of the **Labs** panel, double-click the lab you want to open.

   • Click to highlight a lab, then click **Lab** > **Load Lab**.

   • Select a lab from the list of **Recent Labs** or **Saved Labs** on the **Home** pane.

2. After you have loaded a lab, click the **Lab Instructions** tab and read through the lab instructions.

3. From the **Devices** drop-down menu on the **Consoles** section, select the device(s) that you need to configure in order to complete the lab and follow the steps in the lab. You can also select the device you want to configure by clicking the **NetMap** tab, right-clicking the device, and selecting **Configure in Simulator**.

4. When you have completed the lab, click **Lab** > **Grade Lab** to ensure that you have completed it successfully.

5. You can choose to save your single device configuration or multiple device configurations by selecting the appropriate option in the **File** menu.

You might also be instructed to open labs from a custom lab pack. If any custom labs are available, they will be on the **Custom** tab of the **Labs** pane. To open a custom lab, double-click the lab you want to load.

Module 3

Network Addressing

Lab 3.1 – Subnet Calculation
Lab 3.2 – IPv6 Addressing

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Lab 3.1 – Subnet Calculation

Objective

This lab corresponds to ICND1 Module 3: Network Addressing, of Boson's CCNA Curriculum. In this lab, you can practice calculating network, broadcast, and host addresses.

Lab Tasks

Use the IP address and subnet mask in each table to find the correct network address, first host address, last host address, and broadcast address. The answers to these problems are on the following pages. You can use the space near each IP address block to perform your calculations.

1.

192.168.55.56/29
Network
First Host
Last Host
Broadcast

2.

192.168.10.123/30
Network
First Host
Last Host
Broadcast

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3.

192.168.5.78/27
Network
First Host
Last Host
Broadcast

4.

192.168.15.137/28
Network
First Host
Last Host
Broadcast

5.

192.168.67.158/24
Network
First Host
Last Host
Broadcast

6.

192.168.45.101/25
Network
First Host
Last Host
Broadcast

7.

192.168.78.91/26
Network
First Host
Last Host
Broadcast

8.

172.16.22.53/23
Network
First Host
Last Host
Broadcast

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9.

172.16.96.25/20
Network
First Host
Last Host
Broadcast

10.

172.16.87.56/22
Network
First Host
Last Host
Broadcast

11.

172.16.33.98/21
Network
First Host
Last Host
Broadcast

12.

10.1.56.32/16
Network
First Host
Last Host
Broadcast

13.

15.16.17.18/28
Network
First Host
Last Host
Broadcast

14.

83.18.38.56/26
Network
First Host
Last Host
Broadcast

15.

172.18.43.15/22
Network
First Host
Last Host
Broadcast

16.

192.168.12.146/30
Network
First Host
Last Host
Broadcast

Lab Solutions

Subnet Calculation Answers

You can use the Boson subnetting calculator found at www.boson.com/FreeUtilities and the TCP/IP subnetting worksheet found at www.boson.com/promo/guides/TCPIP-SUB.pdf to verify your answers.

1.

192.168.55.56/29
Network
192.168.55.56
First Host
192.168.55.57
Last Host
192.168.55.62
Broadcast
168.168.55.63

4.

192.168.15.137/28
Network
192.168.15.128
First Host
192.168.15.129
Last Host
192.168.15.142
Broadcast
192.168.15.143

2.

192.168.10.123/30
Network
192.168.10.120
First Host
192.168.10.121
Last Host
192.168.10.122
Broadcast
192.168.10.123

5.

192.168.67.158/24
Network
192.168.67.0
First Host
192.168.67.1
Last Host
192.168.67.254
Broadcast
192.168.67.255

3.

192.168.5.78/27
Network
192.168.5.64
First Host
192.168.5.65
Last Host
192.168.5.94
Broadcast
192.168.5.95

6.

192.168.45.101/25
Network
192.168.45.0
First Host
192.168.45.1
Last Host
192.168.45.126
Broadcast
192.168.45.127

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7.

192.168.78.91/26
Network
192.168.78.64
First Host
192.168.78.65
Last Host
192.168.78.126
Broadcast
192.168.78.127

10.

172.16.87.56/22
Network
172.16.84.0
First Host
172.16.84.1
Last Host
172.16.87.254
Broadcast
172.16.87.255

8.

172.16.22.53/23
Network
172.16.22.0
First Host
172.16.22.1
Last Host
172.16.23.254
Broadcast
172.16.23.255

11.

172.16.33.98/21
Network
172.16.32.0
First Host
172.16.32.1
Last Host
172.16.39.254
Broadcast
172.16.39.255

9.

172.16.96.25/20
Network
172.16.96.0
First Host
172.16.96.1
Last Host
172.16.111.254
Broadcast
172.16.111.255

12.

10.1.56.32/16
Network
10.1.0.0
First Host
10.1.0.1
Last Host
10.1.255.254
Broadcast
10.1.255.255

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13.

15.16.17.18/28
Network
15.16.17.16
First Host
15.16.17.17
Last Host
15.16.17.30
Broadcast
15.16.17.31

16.

192.168.12.146/30
Network
192.168.12.144
First Host
192.168.12.145
Last Host
192.168.12.146
Broadcast
192.168.12.147

14.

83.18.38.56/26
Network
83.18.38.0
First Host
83.18.38.1
Last Host
83.18.38.62
Broadcast
83.18.38.63

15.

172.18.43.15/22
Network
172.18.40.0
First Host
172.18.40.1
Last Host
172.18.43.254
Broadcast
172.18.43.255

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Module 5

Device Management

Lab 5.1 – Router Configuration
Lab 5.2 – TFTP and Router Configuration

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Lab 5.1 – Router Configuration

To perform this lab in the Boson NetSim, navigate to the appropriate lab in the lab menu in NetSim and load the lab. You can then perform the tasks below.

Objective

This lab corresponds to ICND1 Module 5: Device Management, of Boson's CCNA Curriculum. In this lab, you will learn basic help commands available on routers, how to configure IP addresses on routers, and how to configure and use Telnet. A password of **cisco** has been configured on Router2.

Lab Topology

The topology diagram below represents the NetMap in the Simulator:
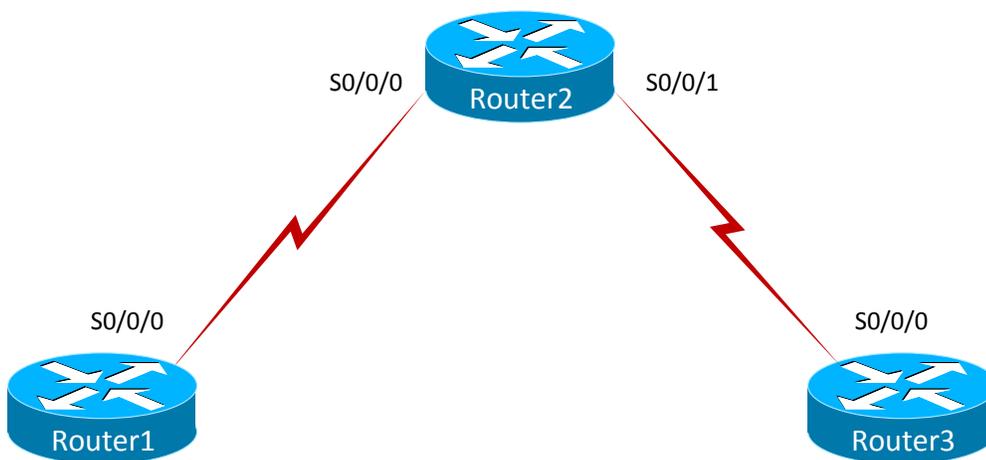
The commands you will need to perform the tasks in this lab, along with their syntax and descriptions, are shown in the Command Summary table below:

Command Summary

Command	Description
clock rate *clock-rate*	sets the clock rate for a data communications equipment (DCE) interface
configure terminal	enters global configuration mode from privileged EXEC mode
enable	enters privileged EXEC mode
end	ends and exits configuration mode
exit	exits one level in the menu structure
hostname *host-name*	sets the device name
interface *type number*	changes from global configuration mode to interface configuration mode
ip address *ip-address subnet-mask*	assigns an IP address to an interface
line console 0	accesses console line configuration mode
line vty 0 4	enters configuration mode for virtual terminal (Telnet) lines

Command	Description
login	enables password checking
no shutdown	enables an interface
password *password*	specifies the password that is required for a user to log in
ping *ip-address*	sends an Internet Control Message Protocol (ICMP) echo request to the specified address
show running-config	displays the active configuration file
show cdp neighbors detail	displays directly connected neighbor devices and their device types, interface names, and IP addresses
telnet *host*	starts the terminal emulation program from a PC, router, or switch; permits you to access devices remotely over the network

The IP addresses and subnet masks used in this lab are shown in the table below:

IP Addresses

Device	Interface	IP Address	Subnet Mask
Router1	Serial 0/0/0	34.25.67.1	255.255.255.0
Router2	Serial 0/0/0	34.25.67.2	255.255.255.0
	Serial 0/0/1	10.10.10.2	255.255.255.0
Router3	Serial 0/0/0	10.10.10.1	255.255.255.0

Lab Tasks

Task 1: Learn the Basic User Interface

1. Connect to the console of Router1.

2. At the user EXEC mode prompt, type a question mark (**?**). This will enable you to view a list of commands that can be issued from the user EXEC mode. At the --MORE-- prompt, press the Spacebar to view the next page of information.

3. Issue the **enable** command to enter privileged EXEC mode.

4. At the privileged EXEC mode prompt, type a question mark (**?**). This will enable you to view a list of commands that can be issued from the privileged EXEC mode. At the --MORE-- prompt, press the Spacebar to view the next page of information.

5. At the privileged EXEC mode prompt, type **show ?** to see all the available **show** commands. In addition to showing available commands that can be issued at the user EXEC and privileged EXEC prompt, the question mark offers additional help.

Task 2: Configure a Host Name and IP Address on Router1

Perform the steps in this task on Router1.

1. Enter the command necessary to access global configuration mode.

2. From global configuration mode, configure a host name of **Router1**.

3. Configure the appropriate IP address on the Serial 0/0/0 interface; refer to the IP Addresses table. Enable the Serial 0/0/0 interface.

Task 3: Configure and Secure the Router for Console and Remote Connections

1. You can connect to a Cisco device remotely by using a protocol such as Telnet or locally by using a console connection. Physical access is necessary to connect to the console connection on a Cisco device. Enter the commands necessary to configure a password of **cisco** for console access on Router1 and require a user to log in to the console port.

2. Test the console password by logging out of the router and then pressing the Enter key. With the console password configured, you are required to provide a password before you can access user EXEC mode.

3. Configure Router1 to allow Telnet remote access using its virtual terminal (vty) lines and require a user to log in to enter commands using a Telnet session. Use **boson** as the password.

4. Cisco devices support remote access via the Telnet or Secure Shell (SSH) protocol. Issue the command necessary to allow only Telnet access to Router1.

5. IP addressing and the remote access configurations have already been performed on Router2. From Router2, what protocol can be used to obtain information about neighboring Cisco devices that are directly connected? _____

6. On Router2, issue the appropriate **show** command. What IP address is assigned to Router1? _____

7. Test your configuration by initiating a Telnet session to Router1 from Router2 by using the IP address you recorded in the previous step. The password configured on Router2 for remote access is **boson**.

8. End the Telnet session from Router2 to Router1.

Lab Solutions

Task 1: Learn the Basic User Interface

1.   You should press Enter to connect to the console of Router1:

```
Press ENTER to Start!
Router>
```

2.   You are now connected to the console of Router1 and are at the user EXEC mode prompt, and you
      should type **?** to view commands that are available from the user EXEC prompt, which is represented
      by the > prompt.

      Note: You can view the additional device output one line at a time by pressing Enter or a page at a time
      by pressing the Spacebar. To stop viewing the output before all of it has been displayed, press the Tab
      key.

```
Router>?
access-enable      Create a temporary Access-List entry
access-profile     Apply user-profile to interface
connect            Open a terminal connection
disable            Turn off privileged commands
disconnect         Disconnect an existing network connection
enable             Turn on privileged commands
exit               Exit from the EXEC
help               Description of the interactive help system
lock               Lock the terminal
login              Log in as a particular user
logout             Exit from the EXEC
mrinfo             Request neighbor and version information from a multicast
                   router
mstat              Show statistics after multiple multicast traceroutes
mtrace             Trace reverse multicast path from destination to source
name-connection    Name and existing network connection
pad                Open a X.29 PAD connection
ping               Send echo messages
ppp                Start IETF Point-to-Point Protocol (PPP)
resume             Resume an active network connection
rlogin             Open an rlogin connection
show               Show running system information
slip               Start a Serial-line IP (SLIP)
systat             Display information about terminal lines
--MORE--
<output omitted>
```

3.   You should issue the **enable** command to enter privileged EXEC mode:

```
Router>enable
Router#
```

4. You should type **?** to view commands that are available from the privileged EXEC mode prompt, which is represented by the `#` prompt. Sample output is shown below:

```
Router#?
access-template       Create a temporary Access-List entry
alps                  ALPS exec commands
archive               manage archive files
bfe                   For manual emergency modes setting
cd                    Change current directory
clear                 Reset functions
clock                 Manage the system clock
configure              Enter configuration mode
copy                  Copy from one file to another
debug                 Debugging functions (see also 'undebug')
delete                Delete a file
dir                   List files on a filesystem
disable
disconnect            Disconnect an existing network connection
elog                  Event-logging control commands
erase                 Erase a filesystem
exit
logout                Exit from the EXEC
more                  Display the contents of a file
mrm                   IP Multicast Routing Monitor Test
ncia                  Start/Stop NCIA Server
ping                  Send echo messages
pwd                   Display current working directory
--MORE--
<output omitted>
```

5. You should type **show ?** to see all the available **show** commands. In addition to showing available commands that can be issued at the user EXEC and privileged EXEC prompt, the question mark offers additional help by showing all the commands available with the initial prefix. Sample output is shown below:

```
Router#show ?
access-lists          List access lists
arp                   ARP table
auto                  Show Automation Template
bgp                   BGP information
cdp                   CDP information
class-map             Show QoS Class-Map
clns                  CLNS network information
clock                 Display the system clock
compress              Show compression statistics
configuration         Contents of Non-Volatile memory
controllers           Interface controller status
crypto                Encryption module
debugging             State of each debugging option
dhcp                  Dynamic Host Configuration Protocol status
<output omitted>
```

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Task 2: Configure a Host Name and IP Address on Router1

1. You should issue the **configure terminal** command to enter global configuration mode:

    ```
    Router#configure terminal
    Router(config)#
    ```

2. You should issue the **hostname Router1** command to configure the host name on Router1:

    ```
    Router(config)#hostname Router1
    Router1(config)#
    ```

3. You should issue the following commands to configure the appropriate IP address and subnet mask on the Serial 0/0/0 interface of Router1:

    ```
    Router1(config)#interface serial 0/0/0
    Router1(config-if)#ip address 34.25.67.1 255.255.255.0
    Router1(config-if)#no shutdown
    ```

Task 3: Configure and Secure the Router for Console and Remote Connections

1. On Router1, you should issue the following commands to configure a password of **cisco** for the console connection and enable password protection on the console connection:

    ```
    Router1(config-if)#exit
    Router1(config)#line console 0
    Router1(config-line)#password cisco
    Router1(config-line)#login
    ```

2. Test the console password by entering the following commands:

    ```
    Router1(config-line)#end
    Router1#disable
    Router1>exit
    Password:cisco
    Router1>
    ```

3. You should issue the following commands on Router1 to enable remote access via the vty lines and configure a password of **boson**:

    ```
    Router1>enable
    Router1#configure terminal
    Router1(config)#line vty 0 4
    Router1(config-line)#login
    Router1(config-line)#password boson
    ```

4.   You should issue the following command to allow only Telnet access to Router1:

```
Router1(config-line)#transport input telnet
```

5.   You should issue the **show cdp neighbors detail** command on Router2 to obtain the IP address of Router1. When enabled, the Cisco Discovery Protocol (CDP) can be used to obtain information about directly connected neighboring Cisco devices. Sample output is shown below:

```
Password:cisco
Router2>enable
Router2#show cdp neighbors detail
<output omitted>
-------------------------
Device ID: Router1
Entry address(es):
  IP address: 34.25.67.1
Platform: Boson 2811 , Capabilities: Router
Interface: Ser0/0/0, Port ID (outgoing port): Ser 0/0/0
Holdtime:  162 sec

Version :
Boson Operating System Software
Software, Version 12.3(16), RELEASE SOFTWARE (fc2)
Copyright (c) 1986-2011 by Systems, Inc.
Compiled Fri 02-Mar-09 17:34 by dchih
```

6.   The IP address assigned to Router1 is 34.25.67.1.

7.   On Router2, you should issue the following commands to initiate a Telnet session to Router1:

```
Router2#telnet 34.25.67.1
Trying 34.25.67.1 ... Open
Password:boson
Router1>
```

8.   The following command will end the Telnet session:

```
Router1>exit
Router2#
```

Sample Configuration Script

Router1

```
Router1#show running-config
Building configuration...
Current configuration : 773 bytes
!
Version 12.3
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname Router1
!
ip subnet-zero
!
ip cef
no ip domain-lookup
!
interface Serial0/0/0
 ip address 34.25.67.1 255.255.255.0
 no ip directed-broadcast
!
interface Serial0/0/1
 no ip address
 no ip directed-broadcast
 shutdown
!
interface FastEthernet0/0
 no ip address
 no ip directed-broadcast
 shutdown
!
interface FastEthernet0/1
 no ip address
 no ip directed-broadcast
 shutdown
!
ip classless
no ip http server
!
line con 0
 login
 password cisco
line aux 0
line vty 0 4
 login
 password boson
 transport input telnet
!
no scheduler allocate
end
```

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