NetSim®
NETWORK SIMULATOR®

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NetSim® NETWORK SIMULATOR®

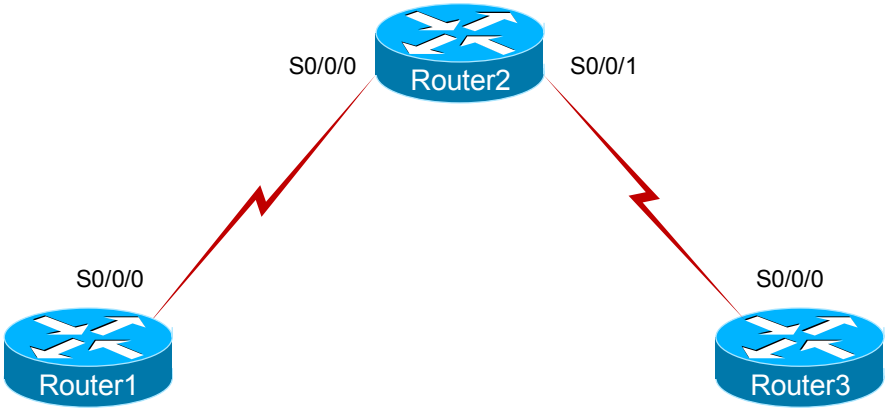
Stand-Alone Lab: Router Basics Part I

Objective

Learn how to properly configure a router. You would typically perform these types of tasks when setting up the local area network (LAN) for a new office. Configure Router1 with basic settings: set the router's host name, and configure security.

Lab Topology

The topology diagram below represents the NetMap in the Simulator.



Command Summary

Command	Description
configure terminal	enters global configuration mode from privileged EXEC mode
disable	returns to user EXEC mode
enable	enters privileged EXEC mode
enable password *password*	sets the enable password
enable secret *password*	sets the enable secret password
end	ends and exits configuration mode
exit	exits one level in the menu structure
hostname *host-name*	sets the device name
line console 0	accesses console line configuration mode
login	enables password checking at login
logout	exits from the user EXEC mode command-line interface (CLI) and ends the current session
password *password*	specifies the password that is required for a user to log in
show running-config	displays the active configuration file

Lab Tasks

Task 1: Load the Initial Network Configuration

The correct topology and configuration files for this lab are loaded automatically when you load this lab from the Lab Tree. If you have multiple monitors you can view this document in a separate window by clicking **Lab** > **Launch External Lab Viewer**. When the lab has finished loading, the Router1 window will open, and the text `Press ENTER to Start` will appear.

Task 2: Connect to a Router

Become familiar with the CLI, user EXEC mode, and privileged EXEC mode.

1. Click inside the Router1 window, and press the appropriate key to begin. You are now connected to Router1.

2. What mode is the router in? _____
   What is the host name of the router? _____

3. On Router1, access privileged EXEC mode.

4. From privileged EXEC mode, return to user EXEC mode.

5. From user EXEC mode, terminate the current session.

Task 3: Learn the Basic User Interface

Become familiar with basic help commands.

1. Press the Enter key to begin the session and to connect to the CLI of Router1.

2. You are now connected to Router1 and are at the user EXEC mode prompt. 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. In addition to showing available commands that can be issued at the user EXEC and privileged EXEC prompt, the question mark offers additional help.

   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.

3. From user EXEC mode, access 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. Type **show** and a question mark (**?**) to see all the show commands. At the `--MORE--` prompt, press the Spacebar to view the next page of information.

6. You can also use the help function with partial words in a command. For example, type **show run?** to view the command that starts with “show run”. Now issue the **show running-config** command to display the active, or running, configuration on Router1. You can press the Tab key after typing **show run**, and the Cisco CLI will fill in the rest of the command for you.

7. Finally, type one of the commands that will exit, or log you out of, the router.

Task 4: Configure Basic Security

Configure basic security for Router1.

1. From user EXEC mode, access privileged EXEC mode.

2. Basic router security is configured from global configuration mode. What command should you issue to enter global configuration mode on Router1? _____

3. When you log in to, or begin a session on, the router, the host name is displayed in front of the prompt (either the `>` or the `#` prompt). The host name of a router is typically configured to enable you to determine the router’s location or function within the network. Configure the router’s host name as **Router1**.

4. The enable password controls access to privileged EXEC mode. This is a very important password because, when it is configured, only those who know the password can access privileged EXEC mode to make configuration changes. Set Router1’s enable password to boson.

5. Test the password. Exit the router, and try to enter privileged EXEC mode. You should be required to enter **boson** as the password in order to enter privileged EXEC mode.

6. The enable password is stored as plain text in the router’s configuration file. Because an enable password is not encrypted, it is more secure to configure an encrypted, secret password to control access to user EXEC mode on a router. On Router1, set an encrypted enable secret password of **cisco**.

7. Test this password by logging out of the router and then typing **enable** at the user EXEC mode prompt. Try to use **boson** as the password to access privileged EXEC mode on Router1. Authentication will fail, because the encrypted enable password overrides the enable password. Therefore, if both enable passwords are set, you must use the encrypted enable password to enter privileged EXEC mode. Enter **cisco** to access Router1.

8. 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. On Router1, configure a password of **cisco** for the console.

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

10. Issue the **enable** command, and provide the password required to access privileged EXEC mode.

11. Sample configuration scripts are provided at the end of labs so that you can review the configurations performed in the lab. You should note that the sample configuration script in this lab displays the plain-text enable password **boson**, the plain-text console password **cisco**, and the encrypted enable secret password **cisco**. The sample configuration script in this document is a copy of the **show running-config** command output from Router1 as it was displayed in NetSim when this document was created. The output you receive might vary slightly.

Lab Solutions

Task 1: Load the Initial Network Configuration

Make sure that the correct topology and configuration files for this lab are loaded. This will occur automatically when you load this lab from the Lab Tree.

Task 2: Connect to a Router

Become familiar with the CLI, user EXEC mode, and privileged EXEC mode.

1. When the lab has finished loading, the Router1 window will open, and the text `Press ENTER to Start` will appear. When you press Enter, you will be connected to Router1.

2. Router1 is currently in user EXEC mode. The prompt for user EXEC mode (`Router>`) is broken into two parts: the host name and the mode. `Router` is Router1's host name, and the `>` prompt indicates user EXEC mode.

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

3. Next, issue the **enable** command to access the privileged EXEC mode. You should note that the `>` changes to a `#` after you issue the **enable** command, which indicates that you are in privileged EXEC mode.

```
Router>enable
Router#
```

4. To return to user EXEC mode, issue the **disable** command.

```
Router#disable
Router>
```

5. From user EXEC mode, issue the **logout** command or the **exit** command to terminate the current session.

```
Router>exit

Router con0 is now available
Press RETURN to get started.
```

Task 3: Learn the Basic User Interface

Become familiar with basic help commands.

1. Press Enter to begin the session and connect to the CLI of Router1.

```
Press RETURN to get started
Router>
```

2. You are now connected to Router1 and are at the user EXEC mode prompt. 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.

   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
telnet             Open a telnet connection
terminal           Set terminal line parameters
traceroute         Trace route to destination
```

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

```
Router>enable
```

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 privileged EXEC mode. At the `--MORE--` prompt, press the Spacebar to view the next page of information.

```
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

<output omitted>
```

5. In addition to showing available commands that can be issued at the user EXEC and privileged EXEC prompt, the question mark (**?**) offers additional help. For example, you can type **show** and a question mark (**?**) to see all the **show** commands. At the `--MORE--` prompt, press the Spacebar to view the next page of information.

```
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
dialer                  Dialer parameters and statistics
etherchannel            EtherChannel information
flash:                    display information about flash: file system
frame-relay             Frame-Relay information
history                 Display the session command history
hosts                   IP domain-name, nameservers, and host table
interfaces              Interface status and configuration
ip                      IP information
ipv6                    IPv6 information
isdn                    ISDN information
isis                    IS-IS routing information
key                     Key information
mpls                    MPLS information
ntp                     Network time protocol

<output omitted>
```

6. You can also use the help function with partial words in a command. For example, type **show run?** to view the command that starts with “show run”. Now issue the s**how running-config** command to display the active, or running, configuration on Router1. You can press the Tab key after typing **show run**, and the Cisco CLI will fill in the rest of the command for you.

```
Router#show run?
running-config
Router#show running-config
Building configuration...
Current configuration : 685 bytes
!
Version 12.3
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname Router
!
ip subnet-zero
<output omitted>
```

7. Finally, type one of the commands that will log you out of the router.

```
Router#exit
```

or

```
Router#disable
```

or

```
Router#logout
```

Task 4: Configure Basic Security

Configure basic security for Router1.

1. From user EXEC mode, issue the **enable** command to enter privileged EXEC mode.

```
Router>enable
Router#
```

2. Basic router security is configured from global configuration mode. To enter global configuration mode on Router1, you must issue the **configure terminal** command from privileged EXEC mode.

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

3. When you log in to the router, the host name is displayed in front of the prompt (either the > or the # prompt). The host name of a router is typically configured to enable you to determine the router's location or function within the network. In this lab, you will configure the router's host name as **Router1**.

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

4. The enable password controls access to privileged EXEC mode. This is a very important password because, when it is configured, only those who know the password can access privileged EXEC mode to make configuration changes. Issue the command necessary to set Router1's enable password to **boson**.

```
Router1(config)#enable password boson
```

5. Test the password. Exit the router, and try to enter privileged EXEC mode. Notice that you have to enter **boson** as the password in order to enter privileged EXEC mode.

```
Router1(config)#exit
Router1#exit
Router1>enable
Password:boson
```

6. The enable password is stored as plain text in the router's configuration file. Because an enable password is not encrypted, it is more secure to configure an encrypted password to control access to user EXEC mode on a router. The **enable secret** *password* command stores the password in an encrypted form. Issue the **enable secret cisco** command from global configuration mode on Router1 to set the enable secret password to **cisco**.

```
Router1#configure terminal
Router1(config)#enable secret cisco
```

7. Test this password by logging out of the router and then typing **enable** at the user EXEC mode prompt. Try to use **boson** as the password to access privileged EXEC mode on Router1. Authentication will fail, because the enable secret password overrides the enable password. Therefore, if both enable passwords are set, you must use the enable secret password to enter privileged EXEC mode. Enter **cisco** to access Router1.

```
Router1(config)#exit
Router1#exit
Router1>enable
Password:boson
% Authentication failed
Password:cisco
Router1#
```

8. 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. You should issue the following commands to configure a password of **cisco** for Router1's console connection:

```
Router1#configure terminal
Router1(config)#line console 0
Router1(config-line)#login
login disabled on line 0 until password is set.
Router1(config-line)#password cisco
```

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

```
Router1(config-line)#end
Router1#disable
Router1>exit
Router1 con0 is now available
Press RETURN to get started.
Password:cisco
Router1>
```

10. Issue the **enable** command, and provide the password required to access privileged EXEC mode.

```
Router1>enable
Password:cisco
Router1#
```

11. Sample configuration scripts are provided at the end of labs so that you can review the configurations performed in the lab. You should note that the sample configuration script in this lab displays the plain-text enable password **boson**, the plain-text console password **cisco**, and the encrypted enable secret password **cisco**. The sample configuration script in this document is a copy of the **show running-config** command output from Router1 as it was displayed in NetSim when this document was created. The output you receive may vary slightly.

Sample Configuration Script

Router1

```
Router1#show running-config
Building configuration...
!
Version 12.3
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname Router1
enable secret 5 $sdf$6978yhg$jnb76sd
enable password boson
!
ip subnet-zero
!
ip cef
no ip domain-lookup
!
interface Serial0/0/0
 no ip address
 no ip directed-broadcast
 shutdown
!
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
!
no scheduler allocate
end
```