Interconnecting Cisco Networking Devices Part 1

100-101 Lab Guide
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. To learn more about the Boson NetSim or to purchase and download the software, please visit www.boson.com/netsim.

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Module 5
Device Management

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

To perform this lab in the Boson NetSim, please download the necessary files (refer to your purchase receipt for the download link), navigate to the appropriate lab in the lab menu in NetSim, and load the lab. You can then accomplish 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:

```
S0/0/0  Router1  S0/0/0
      |         |      |
      |         |      |
      S0/0/0  Router2  S0/0/1
      |         |      |
      |         |      |
      S0/0/0  Router3  S0/0/0
```

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:

<table>
<thead>
<tr>
<th>Command Summary Table</th>
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<tr>
<td>Command</td>
</tr>
<tr>
<td>clock rate clock-rate</td>
</tr>
<tr>
<td>configure terminal</td>
</tr>
<tr>
<td>enable</td>
</tr>
<tr>
<td>end</td>
</tr>
<tr>
<td>exit</td>
</tr>
<tr>
<td>hostname host-name</td>
</tr>
<tr>
<td>interface type number</td>
</tr>
<tr>
<td>ip address ip-address subnet-mask</td>
</tr>
<tr>
<td>line console 0</td>
</tr>
<tr>
<td>line vty 0 4</td>
</tr>
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</table>
The IP addresses and subnet masks used in this lab are shown in the table below:

### IP Addresses

<table>
<thead>
<tr>
<th>Device</th>
<th>Interface</th>
<th>IP Address</th>
<th>Subnet Mask</th>
</tr>
</thead>
<tbody>
<tr>
<td>Router1</td>
<td>Serial 0/0/0</td>
<td>34.25.67.1</td>
<td>255.255.255.0</td>
</tr>
<tr>
<td>Router2</td>
<td>Serial 0/0/0</td>
<td>34.25.67.2</td>
<td>255.255.255.0</td>
</tr>
<tr>
<td></td>
<td>Serial 0/0/1</td>
<td>10.10.10.2</td>
<td>255.255.255.0</td>
</tr>
<tr>
<td>Router3</td>
<td>Serial 0/0/0</td>
<td>10.10.10.1</td>
<td>255.255.255.0</td>
</tr>
</tbody>
</table>

### 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--
   ```

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
delog Event-logging control commands
derase Erase a filesystem
exit logout Exit from the EXEC
file 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>
```
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 from 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**

```bash
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
!
o no scheduler allocate
end
```
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Contact Information

E-Mail: support@boson.com
Phone: 877-333-EXAM (3926)  
615-889-0121
Fax: 615-889-0122
Address: 25 Century Blvd., Ste. 500  
Nashville, TN 37214