Lab 3: Basic Device Configuration

Given the following Addressing table use it along this experiment:

		IP Address: 192.133.219.0		Subnet mask :255.255.255.240
#	Subnet ID	First host address	Last host address	Broadcast
0	198.133.219.0	198.133.219.1	198.133.219.14	198.133.219.15
1	198.133.219.16	198.133.219.17	198.133.219.30	198.133.219.31
2	198.133.219.32	198.133.219.33	198.133.219.46	198.133.219.47
3	198.133.219.48	198.133.219.49	198.133.219.62	198.133.219.63
4	198.133.219.64	198.133.219.65	198.133.219.78	198.133.219.79
5	198.133.219.80	198.133.219.81	198.133.219.94	198.133.219.95

CISCO Internet Operating System (IOS)

Cisco IOS Command Modes

The following table contains the different IOS command modes, their roles and the shape of the command prompt that illustrates the mode. Make sure to study this table carefully as it is essential for proper working with Cisco routers and switches.

Aim: Study of basic network command and Network configuration commands.

All commands related to Network configuration which includes how to switch to privilege mode and normal mode and how to configure router interface and how to save this configuration to flash memory or permanent memory.

This commands includes
• Configuring the Router commands
• General Commands to configure network
• Privileged Mode commands of a router
• Router Processes & Statistics
• IP Commands
• Other IP Commands e.g. show ip route etc.

CLI Command Modes

This section describes the CLI command mode structure. Command modes support specific Cisco IOS commands. For example, the **interface interface-id** command only works when entered in global configuration mode.

These are the main command modes for the switch or router:

> • User EXEC

> • Privileged EXEC

> • Global configuration

> • Interface configuration

> • VLAN configuration

> • Line configuration

Command Mode	Access Method	Prompt	Exit Mode	**How to Enter the Mode**
User EXEC	This is the first level of access. (For the switch) Change terminal settings, perform basic tasks, and list system information.	Switch>	Enter the logout command.	Log in. To enter privileged EXEC mode, enter the enable command.
Privileged EXEC	From user EXEC mode, enter the enable command.	Switch#	To exit to user EXEC mode, enter the disable command or exit.	Enter the **enable** EXEC command from user EXEC mode.
Global configuration	From privileged EXEC mode, enter the configure command.	Switch(config)#	To exit to privileged EXEC mode,	Enter the **configure** privileged EXEC command

			enter the exit or end command, or press Ctrl-Z.	from global configuration mode.
Interface configuration	From global configuration mode, specify an interface by entering the interface command followed by an interface identification.	Switch(config-if)#	To exit to privileged EXEC mode, enter the end command, or press Ctrl-Z. To exit to global configuration mode, enter the exit command.	To enter interface configuration mode, enter the interface configuration command.
VLAN configuration	From privileged EXEC mode, enter the vlan database command.	Switch(vlan)#	To exit to privileged EXEC mode, enter the exit command.	

Background / Preparation

In this activity, you will configure these settings on the customer Cisco Catalyst 2960 switch:

- Host name
- Console password
- vty password
- Privileged EXEC mode password
- Privileged EXEC mode secret
- IP address on VLAN1 interface
- Default gateway

Note: Not all commands are graded by Packet Tracer.

Step 1: Configure the switch host name.

a. From the PC, use a console cable and terminal emulation software to connect to the console of the customer Cisco Catalyst 2960 switch.

b. Set the host name on the switch to **SW1** using these commands.

Switch>**enable**

Switch#**configure terminal**

Switch(config)#**hostname SW1**

Step 2: Configure the privileged mode password and secret.

a. From global configuration mode, configure the password as **cisco**.

SW1 (config)#**enable password cisco**

b. From global configuration mode, configure the secret as **cisco123**.

SW1 (config)#**enable secret cisco123**

Step 3: Configure the console password.

a. From global configuration mode, switch to configuration mode to configure the console line.

SW1 (config)#**line console 0**

b. From line configuration mode, set the password to **cisco** and require the password to be entered at login.

SW1 (config-line)#**password cisco**

SW1 (config-line)#**login**

SW1 (config-line)#**exit**

Step 4: Configure the vty password.

a. From global configuration mode, switch to the configuration mode for the vty lines 0 through 15.

SW1 (config)#**line vty 0 15**

b. From line configuration mode, set the password to **cisco** and require the password to be entered at login.

SW1 (config-line)#**password cisco**

SW1 (config-line)#**login**

SW1 (config-line)#**exit**

Step 5: Configure an IP address on interface VLAN1.

From global configuration mode, switch to interface configuration mode for VLAN1, and assign the IP address 192.168.1.5 with the subnet mask of 255.255.255.0.

SW1 (config)#**interface vlan 1**

CustomerSwitch(config-if)#**ip address 192.168.1.5 255.255.255.0**

SW1 (config-if)#**no shutdown**

SW1 (config-if)#**exit**

Step 6: Configure the default gateway.

a. From global configuration mode, assign the default gateway to 192.168.1.1.

SW1 (config)#**ip default-gateway 192.168.1.1**

b. Click the **Check Results** button at the bottom of this instruction window to check your work.

Step 7: Verify the configuration.

The Customer Switch should now be able to ping the ISP Server at 209.165.201.10. The first one or two pings may fail while ARP converges.

SW1 (config)#**end**

SW1#ping 209.165.201.10

Basic Router Configuration

Viewing the Default Configuration

When you first boot up your Cisco router, some basic configuration has already been performed. All of the LAN and WAN interfaces have been created, console and VTY ports are configured, and the inside interface for Network Address Translation has been assigned. Use the **show running-config** command to view the initial configuration.

Router# show running-config

Configuring Basic Parameters

To configure the global parameters for your router, follow these steps.

1. configure terminal

2. hostname name

3. enable secret password

4. no ip domain-lookup

Router Modes

Router>	User mode
Router#	Privileged mode
Router(config)#	Global configuration mode
Router(config-if)#	Interface mode
Router(config-subif)#	Subinterface mode
Router(config-line)#	Line mode
Router(config-router)#	Router configuration mode

Command	Purpose
Step 1 configure terminal	
Example:	
Router> enable	
Router# configure terminal To Enters global configuration mode, when using the console port.	
Step 2 hostname name	
Example:	
Router(config)# hostname Router	
To specifies the name for the router. **Step 3 enable secret password** Example:	

Router(config)# enable secret cr1ny5ho

To specifies an encrypted password to prevent unauthorized access to the router.

Step 4 no ip domain-lookup

Example:

Router(config)# no ip domain-lookup

To disables the router from translating unfamiliar words (typos) into IP addresses.

Configuring Gigabit Ethernet WAN Interfaces

To configure Gigabit Ethernet (GE) WAN interfaces, follow these steps, beginning in global configuration mode.

1. configure terminal

2. interface gigabitethernet slot/port
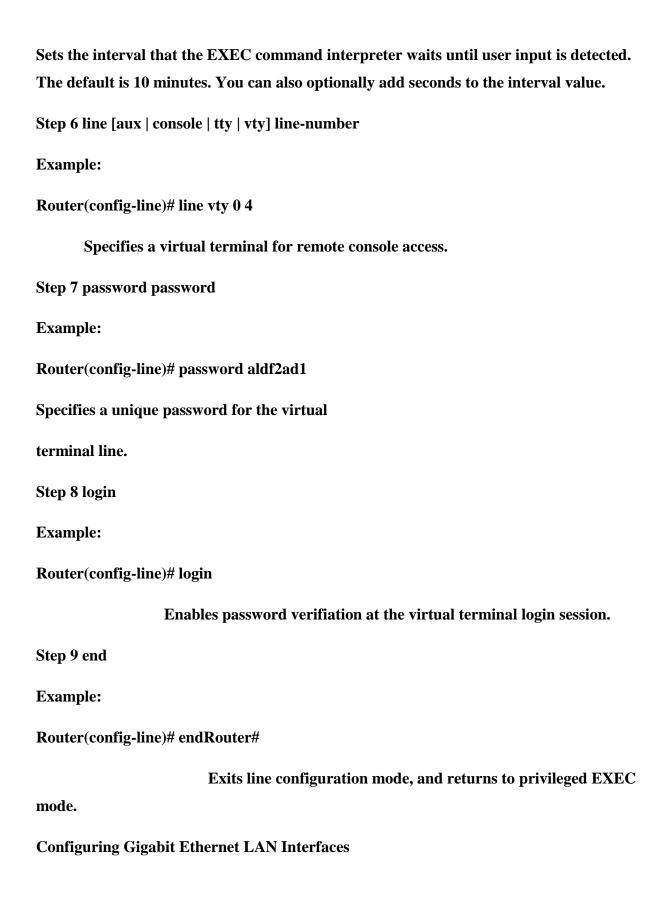
3. ip address ip-address mask

4. no shutdown

5. exit

	Command	Purpose
Step 1	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 2	**interface gigabitethernet** *slot/port* **Example:** `Router(config)# interface gigabitethernet 0/8`	Enters the configuration mode for a Gigabit Ethernet interface on the router. **Note** GigabitEthernet WAN Interfaces are 0/8 and 0/9 for Cisco C841M-8X ISR and 0/4 to 0/5 for Cisco C841M-4X
Step 3	**ip address** *ip-address mask* **Example:** `Router(config-if)# ip address 192.168.12.2 255.255.255.0`	Sets the IP address and subnet mask for the specified GE interface.
Step 4	**no shutdown** **Example:** `Router(config-if)# no shutdown`	Enables the GE interface, changing its state from administratively down to administratively up.
Step 5	**exit** **Example:** `Router(config-if)# exit`	Exits configuration mode for the GE interface and returns to global configuration mode.

Configuring Command-Line Access

To configure parameters to control access to the router, perform the following steps.

1. configure terminal

2. line [aux | console | tty | vty] line-number

3. password password

4. login

5. exec-timeout minutes [seconds]

6. line [aux | console | tty | vty] line-number

7. password password

8. login

9. end

Command   **Purpose**

Step 1 configure terminal

Example:

Router# configure terminal

                                           Enters global configuration mode.

Step 2 line [aux | console | tty | vty] line-number

Example:

Router(config)# line console 0

                               Enters line configuration mode, and specifies the type of line

Step 3 password password

Example:

Router(config)# password 5dr4Hepw3

Specifies a unique password for the console terminal line.

Step 4 login

Example:

Router(config-line)# login

Enables password verification at the terminal login session.

Step 5 exec-timeout minutes [seconds]

Example:

Router(config-line)# exec-timeout 5 30

Sets the interval that the EXEC command interpreter waits until user input is detected. The default is 10 minutes. You can also optionally add seconds to the interval value.

Step 6 line [aux | console | tty | vty] line-number

Example:

Router(config-line)# line vty 0 4

Specifies a virtual terminal for remote console access.

Step 7 password password

Example:

Router(config-line)# password aldf2ad1

Specifies a unique password for the virtual

terminal line.

Step 8 login

Example:

Router(config-line)# login

Enables password verifiation at the virtual terminal login session.

Step 9 end

Example:

Router(config-line)# endRouter#

Exits line configuration mode, and returns to privileged EXEC mode.

Configuring Gigabit Ethernet LAN Interfaces

To manually configure Gigabit Ethernet (GE) LAN interfaces, follow these steps, beginning in global configuration mode.

SUMMARY STEPS

1. configure terminal

2. interface gigabitethernet slot/port

3. ip address ip-address mask

4. no shutdown

5. exit

Command Purpose

Step 1 configure terminal

Example:

Router# configure terminal

Enters global configuration mode.

Step 2 interface gigabitethernet slot/port

Example:

Router(config)# interface gigabitethernet 0/1

Enters the configuration mode for a Gigabit Ethernet interface on the router.

Note GigabitEthernet LAN Interfaces are 0/0 to 0/7 for Cisco C841M-8X ISR and 0/0 to 0/3 for Cisco C841M-4X ISR.

Step 3 ip address ip-address mask

Example:

Router(config-if)# ip address 192.168.12.2 255.255.255.0

Sets the IP address and subnet mask for the specified GE interface.

Step 4 no shutdown

Example:

Router(config-if)# no shutdown

Enables the GE interface, changing its state from administratively down to administratively up.

Step 5 exit

Example:

Router(config-if)# exit

Lab 4

Configuring a Cisco Router as a DHCP Server

Objectives

• Configure the customer Cisco 1841 ISR as a DHCP server.

Background / Preparation

In this activity, you will continue to configure the Cisco 1841 ISR router for the customer network by
configuring the DHCP service. The customer has several workstations that need to be automatically configured
with IP addresses on the local subnet and appropriate DHCP options to allow access to the Internet.
The DHCP pool will use the 192.168.1.0/24 network but the first 49 addresses are excluded. The default
gateway and DNS server also need to be configured as 192.168.1.1 and 192.168.1.10.
For this activity, both the user and privileged EXEC passwords are **cisco**.
Note: Packet Tracer does not currently support the domain name and lease period options. These options are not
used in this activity.

Step 1: Configure the DHCP service.

a. From the customer workstation, use a console cable and terminal emulation software to connect to the

console of the customer Cisco1841 ISR.

b. Log in to the console of the Cisco 1841 ISR and enter global configuration mode.

c. Before creating a DHCP pool, configure the addresses that are excluded. The range is from 192.168.1.1 to 192.168.1.49.

CustomerRouter(config)#**ip dhcp excluded-address 192.168.1.1 192.168.1.49**

d. Create a DHCP pool called pool1.

CustomerRouter(config)#**ip dhcp pool pool1**

e. Define the network address range for the DHCP pool.

CustomerRouter(dhcp-config)#**network 192.168.1.0 255.255.255.0**

f. Define the DNS server as 192.168.1.10.

CustomerRouter(dhcp-config)#**dns-server 192.168.1.10**

g. Define the default gateway as 192.168.1.1.

CustomerRouter(dhcp-config)#**default-router 192.168.1.1**

h. Add an exclusion range of 192.168.1.1 to 192.168.1.49 to the DHCP pool.

CustomerRouter(dhcp-config)#**exit**

CustomerRouter(config)#**ip dhcp excluded-address 192.168.1.1 192.168.1.49**

i. Exit the terminal.

Step 2: Verify the DHCP configuration.

a. From the customer workstation, open the **Command Prompt** window.

b. Type **ipconfig /release** to release the current IP address.

c. Type **ipconfig /renew** to request a new IP address on the local network.

d. Verify that the IP address has been correctly assigned by pinging the LAN IP address of the Cisco

1841 ISR.

e. Click the **Check Results** button at the bottom of this instruction window to check your work.

Reflection

a. What is the purpose of DHCP on the customer network?

b. What IP address is assigned to the workstation after its IP address is renewed?

c. What other DHCP options can be defined on the Cisco 1841 ISR router that are not configured in this activity?

Referring to the figure above, R1 is a stub router. It is only connected to R2. Currently R1
has three static routes, which are used to reach all of the remote networks in our topology.
All three static routes have the exit interface Serial 0/0/0, forwarding packets to the nexthop router R2.

The three static routes on R1 are:

ip route 172.16.1.0 255.255.255.0 serial 0/0/0

ip route 192.168.1.0 255.255.255.0 serial 0/0/0

ip route 192.168.2.0 255.255.255.0 serial 0/0/0

R1 is an ideal candidate to have all of its static routes replaced by a single default route.

First, delete the three static routes:

R1(config)#no ip route 172.16.1.0 255.255.255.0 serial 0/0/0

R1(config)#no ip route 192.168.1.0 255.255.255.0 serial 0/0/0

R1(config)#no ip route 192.168.2.0 255.255.255.0 serial 0/0/0

Next, configure the single default static route using the same Serial 0/0/0 exit interface as
the three previous static routes:

R1(config)#ip route 0.0.0.0 0.0.0.0 serial 0/0/0