

Network and Cybersecurity essentials (ACCA4024 Network Lab)

Task 2(To be done on real Cisco devices)

Can also be done in Packet Tracer if real devices are not available.

Objectives

1. Gain a comprehensive understanding of fundamental Cisco CLI commands and their appropriate syntax.
2. Successfully configure a basic network by accurately cabling routers and switches.

Task 1

Basic Cisco Configurations

1. 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/Router:

- User EXEC
- Privileged EXEC
- Global configuration
- Interface configuration
- Line configuration

User EXEC Mode

After you access the device, you are automatically in user EXEC command mode. The EXEC commands available at the user level are a subset of those available at the privileged level. In general, use the *user EXEC* commands to temporarily change terminal settings, perform basic tests, and list system information.

The supported commands can vary depending on the version of software in use. To display a comprehensive list of commands, enter a question mark (?) at the prompt.

Switch> ?

Router> ?

Privileged EXEC Mode

Because many of the privileged commands configure operating parameters, privileged access should be password-protected to prevent unauthorized use. The privileged command set includes those commands contained in user EXEC mode, as well as the **configure** privileged EXEC command through which you access the remaining command modes. If your system administrator has set a password, you are prompted to enter it before being granted access to privileged EXEC mode. The password does not appear on the screen and is case sensitive. The privileged EXEC mode prompt is the device name followed by the pound sign (#).

Switch#

Enter the **enable** command to access privileged EXEC mode:

Switch> **enable**

Switch#

Router#

Enter the **enable** command to access privileged EXEC mode:

Router>en

Router#

The supported commands can vary depending on the version of software in use. To display a comprehensive list of commands, enter a question mark (?) at the prompt.

Switch# ?

To return to user EXEC mode, enter the **disable** privileged EXEC command.

Global Configuration Mode

Global configuration commands apply to features that affect the device as a whole. Use the **configure** privileged EXEC command to enter global configuration mode. The default is to enter commands from the management console.

When you enter the **configure** command, a message prompts you for the source of the configuration commands:

Router# **configure**

Configuring from terminal, memory, or network [terminal]?

You can specify either the terminal or NVRAM as the source of configuration commands.

This example shows you how to access global configuration mode:

Router# **configure terminal**

Router(config)#

Enter configuration commands, one per line. End with CTRL/Z.

Interface Configuration Mode

Interface configuration commands modify the operation of the interface. Interface configuration commands always follow a global configuration command, which defines the interface type.

Use the **interface** *interface-id* command to access interface configuration mode. The new prompt means interface configuration mode.

```
Router(config)#interface gigabitEthernet 0/0/0
Router(config-if)#
```

The supported commands can vary depending on the version of software in use. To display a comprehensive list of commands, enter a question mark (?) at the prompt.

```
Router(config-if)#?
```

To exit interface configuration mode and to return to global configuration mode, enter the **exit** command. To exit interface configuration mode and to return to privileged EXEC mode, enter the **end** command, or press **Ctrl-Z**.

Verify and Save Configuration

To check the current configuration on the router and switches:

```
Router# show running-config
```

To ensure that the configuration is saved and remains after a reboot:

```
Router# write memory
```

OR

```
Router# copy running-config startup-config
```

OR

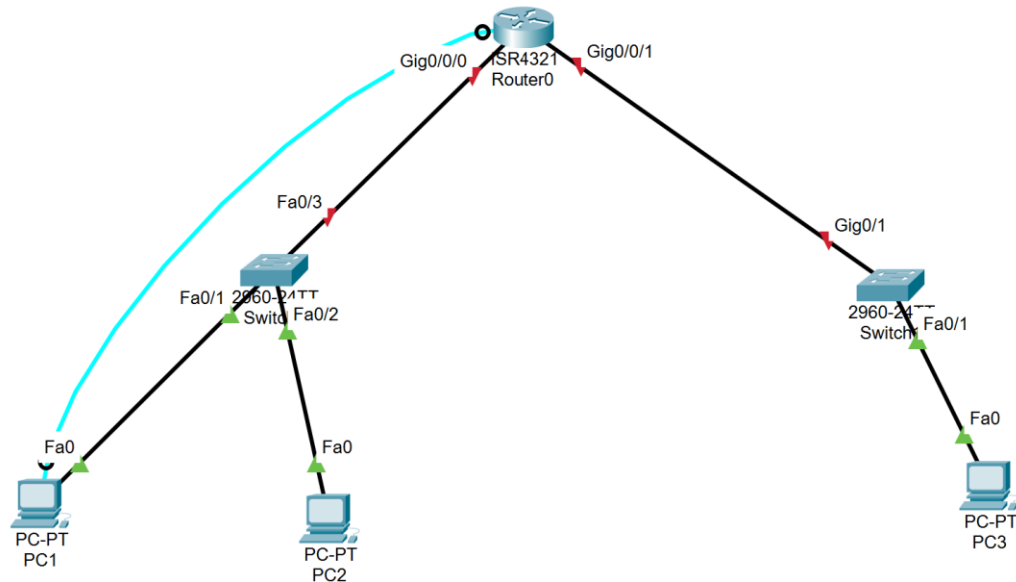
```
Router# wr
```

Task 2

Scenario

A small company has a network setup where a single **Router (R1)** connects two departments through two **Switches (S1 & S2)**. Two PCs (**PC1 & PC2**) are connected to **Switch 1 (S1)**, and one PC (**PC3**) is connected to **Switch 2 (S2)**. The goal is to configure the network so that all PCs can communicate.

Cable the Topology as shown



Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
R1	G0/0/0	192.168.1.1	255.255.255.0	N/A
R1	G0/0/1	192.168.2.1	255.255.255.0	N/A
PC1	NIC	192.168.1.2	255.255.255.0	192.168.1.1
PC2	NIC	192.168.1.3	255.255.255.0	192.168.1.1
PC3	NIC	192.168.2.2	255.255.255.0	192.168.2.1

Step 1: Change Hostnames

Changing hostnames helps in identifying network devices.

Router Configuration (R1)

Sample code

```

Router> enable
Router# configure terminal
Router(config)# hostname R1
R1(config)# exit

```

Switch 1 Configuration (S1)

```
Switch> enable
Switch# config t
Switch(config)# hostname S1
S1(config)# exit
```

Switch 2 Configuration (S2)

“Write your own commands”

Step 2: Assign IP Addresses to Router Interfaces

The router interfaces need to be configured with IP addresses for inter-network communication.

```
R1> enable
R1# configure terminal
R1(config)# interface GigabitEthernet0/0/0
R1(config-if)# ip address 192.168.1.1 255.255.255.0
R1(config-if)# no shutdown
R1(config-if)# exit
```

```
R1(config)# int gig0/0/1
R1(config-if)# ip address 192.168.2.1 255.255.255.0
R1(config-if)# no shut
R1(config-if)# exit
```

Step 3: Configure PCs

Manually assign IP addresses to each PC:

- **PC1:**
 - IP: 192.168.1.2
 - Subnet Mask: 255.255.255.0
 - Gateway: 192.168.1.1
- **PC2:**
 - IP: 192.168.1.3
 - Subnet Mask: 255.255.255.0
 - Gateway: 192.168.1.1
- **PC3:**
 - IP: 192.168.2.2
 - Subnet Mask: 255.255.255.0
 - Gateway: 192.168.2.1

Step 4: Test Connectivity

Verify that the PCs can communicate by using the **ping** command.

From PC1:

ping 192.168.1.3 (Ping PC2)
ping 192.168.2.2 (Ping PC3)

From PC3:

ping 192.168.1.2 (Ping PC1)

If the pings are successful, the network is working correctly.