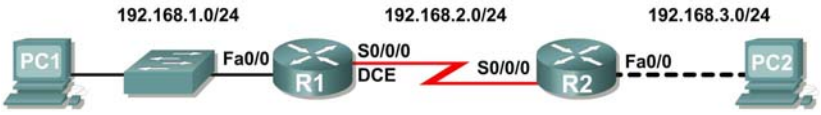
CSE 421
Computer Networks
Lab 1.5.2: Basic Router Configuration

ID_____

Topology Diagram



Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
R1	Fa0/0	192.168.1.1	255.255.255.0	N/A
	S0/0/0	192.168.2.1	255.255.255.0	N/A
R2	Fa0/0	192.168.3.1	255.255.255.0	N/A
	S0/0/0	192.168.2.2	255.255.255.0	N/A
PC1	NIC	192.168.1.10	255.255.255.0	192.168.1.1
PC2	NIC	192.168.3.10	255.255.255.0	192.168.3.1

Learning Objectives

- Upon completion of this lab, you will be able to:
- Cable a network according to the Topology Diagram.
- Erase the startup configuration and reload a router to the default state.
- Perform basic configuration tasks on a router.
- Configure and activate Ethernet interfaces.
- Test and verify configurations.
- Reflect upon and document the network implementation.

Task 1: Cable the Network.

Be sure to connect the serial DCE cable to router R1 and the serial DTE cable to router R2.

Answer the questions 1 to 3 in the given question sheet

Task 2: Erase and Reload the Routers.

Step 1: Establish a terminal session to router R1.

Step 1a :Connect the console cable to the router R1 and PC1.

1. **Connect the console cable to the router console port.**
2. **Connect the console cable to PC1 (RS232 Port).**

Step 1b Create a terminal connection to the R1 router.

1. **Go to the Desktop of PC1 and then start the Terminal Program.**
2. **Use the following parameters when configuring the connection.**
    - **9600 baud**
    - **8 data bits**
    - **No parity**
    - **1 stop bit**
    - **No flow control**
3. **When the Terminal session window comes up, press the Enter key.**

Step 2: Repeat Steps 1a through 1b on router R2 to establish a terminal session.

Step 2: Enter privileged EXEC mode in Router R1.

```
Router>enable
Router#
```

Step 3: Clear the configuration.
To clear the configuration, issue the **erase startup-config** command. Press **Enter** when prompted to **[confirm]** that you really do want to erase the configuration currently stored in NVRAM.

```
Router#erase startup-config
Erasing the nvram filesystem will remove all files! Continue? [confirm]
[OK]
Erase of nvram: complete
Router#
```

Step 4: Reload configuration.
When the prompt returns, issue the **reload** command. Answer **no** if asked to save changes.

Answer the question no. 4 in the given question sheet

The result should look something like this:

```
Router#reload
System configuration has been modified. Save? [yes/no]: no
Proceed with reload? [confirm]
```

Press **Enter** when prompted to **[confirm]** that you really do want to reload the router. After the router finishes the boot process, choose not to use the AutoInstall facility, as shown:

```
Would you like to enter the initial configuration dialog? [yes/no]: no
Would you like to terminate autoinstall? [yes]: [Press Return]
Press Enter to accept default.
Press RETURN to get started!
```

Step 5: Repeat Steps 1 through 4 on router R2 to remove any startup configuration file that may be present.

Task 3: Perform Basic Configuration of Router R1.

Step 1: Establish a HyperTerminal session to router R1.

Step 2: Enter privileged EXEC mode.

```
Router>enable
Router#
```

Step 3: Enter global configuration mode.

```
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
```

Step 4: Configure the router name as R1.
Enter the command **hostname R1** at the prompt.

```
Router(config)#hostname R1
R1(config)#
```

Step 5: Disable DNS lookup.
Disable DNS lookup with the **no ip domain-lookup** command.

```
R1(config)#no ip domain-lookup
R1(config)#
```

Answer the question no. 5 and 6 in the given question sheet

Step 6: Configure the EXEC mode password.
Configure the EXEC mode password using the **enable secret** *password* command. Use **class** for the *password*.

```
R1(config)#enable secret class
R1(config)#
```

Step 7: Configure a message-of-the-day banner.
Configure a message-of-the-day banner using the **banner motd** command.

```
R1(config)#banner motd &
Enter TEXT message. End with the character '&'.
********************************
!!!AUTHORIZED ACCESS ONLY!!!
********************************
&
R1(config)#
```

Answer the question no. 7and 8 in the given question sheet

Step 8: Configure the console password on the router.
Use **cisco** as the password. When you are finished, exit from line configuration mode.

```
R1(config)#line console 0
R1(config-line)#password cisco
R1(config-line)#login
R1(config-line)#exit
R1(config)#
```

Step 9: Configure the password for the virtual terminal lines.
Use **cisco** as the password. When you are finished, exit from line configuration mode.

```
R1(config)#line vty 0 4
R1(config-line)#password cisco
R1(config-line)#login
R1(config-line)#exit
R1(config)#
```

Step 10: Configure the FastEthernet0/0 interface.
Configure the FastEthernet0/0 interface with the IP address 192.168.1.1/24.

```
R1(config)#interface fastethernet 0/0
R1(config-if)#ip address 192.168.1.1 255.255.255.0
R1(config-if)#no shutdown

%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed
state to up
R1(config-if)#
```

Step 11: Configure the Serial0/0/0 interface.
Configure the Serial0/0/0 interface with the IP address 192.168.2.1/24. Set the clock rate to 64000.
Note: The purpose of the **clock rate** command is explained in Chapter 2: Static Routes.

```
R1(config-if)#interface serial 0/0/0
R1(config-if)#ip address 192.168.2.1 255.255.255.0
R1(config-if)#clock rate 64000
R1(config-if)#no shutdown
R1(config-if)#
```

Note: The interface will be activated until the serial interface on R2 is configured and activated

Step 12: Return to privileged EXEC mode.

Use the **end** command to return to privileged EXEC mode.

```
R1(config-if)#end
R1#
```

Step 13: Save the R1 configuration.
Save the R1 configuration using the **copy running-config startup-config** command.

```
R1#copy running-config startup-config
Building configuration...
[OK]
R1#
```

Answer the question no. 9 in the given question sheet

Task 4: Perform Basic Configuration of Router R2.

Step 1: For R2, repeat Steps 1 through 9 from Task 3.

Step 2: Configure the Serial 0/0/0 interface.
Configure the Serial 0/0/0 interface with the IP address 192.168.2.2/24.

```
R2(config)#interface serial 0/0/0
R2(config-if)#ip address 192.168.2.2 255.255.255.0
R2(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state
to up
R2(config-if)#
```

Step 3: Configure the FastEthernet0/0 interface.
Configure the FastEthernet0/0 interface with the IP address 192.168.3.1/24.

```
R2(config-if)#interface fastethernet 0/0
R2(config-if)#ip address 192.168.3.1 255.255.255.0
R2(config-if)#no shutdown
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed
state to up
R2(config-if)#
```

Step 4: Return to privileged EXEC mode.
Use the **end** command to return to privileged EXEC mode.

```
R2(config-if)#end
R2#
```

Step 5: Save the R2 configuration.
Save the R2 configuration using the **copy running-config startup-config** command.

```
R2#copy running-config startup-config
Building configuration...
[OK]
R2#
```

Task 5: Configure IP Addressing on the Host PCs.

Step 1: Configure the host PC1.
Configure the host PC1 that is attached to R1 with an IP address of 192.168.1.10/24 and a default gateway of 192.168.1.1.

Step 2: Configure the host PC2.
Configure the host PC2 that is attached to R2 with an IP address of 192.168.3.10/24 and a default gateway of 192.168.3.1.

Task 6: Verify and Test the Configurations.

Step 1: Verify that routing tables have the following routes using the show ip route command.
The **show ip route** command and output will be thoroughly explored in upcoming chapters. For now,you are interested in seeing that both R1 and R2 have two routes. Both routes are designated with a **C**.
These are the directly connected networks that were activated when you configured the interfaces on each router. If you do not see two routes for each router as shown in the following output, proceed to Step 2.

```
R1#show ip route
Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2
i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default, U - per-user static route
o - ODR, P - periodic downloaded static route
Gateway of last resort is not set
C 192.168.1.0/24 is directly connected, FastEthernet0/0
C 192.168.2.0/24 is directly connected, Serial0/0/0
------------------------
```

```
R2#show ip route
Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2
i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default, U - per-user static route
o - ODR, P - periodic downloaded static route
Gateway of last resort is not set
C 192.168.2.0/24 is directly connected, Serial0/0/0
C 192.168.3.0/24 is directly connected, FastEthernet0/0
```

Step 2: Verify interface configurations.
Another common problem is router interfaces that are not configured correctly or not activated. Use the **show ip interface brief** command to quickly verify the configuration of each router's interfaces.
Your output should look similar to the following:

```
R1#show ip interface brief
Interface IP-Address OK? Method Status Protocol
FastEthernet0/0 192.168.1.1 YES manual up up
FastEthernet0/1 unassigned YES unset administratively down down
Serial0/0/0 192.168.2.1 YES manual up up
Serial0/0/1 unassigned YES unset administratively down down
Vlan1 unassigned YES manual administratively down down
```

```
R2#show ip interface brief
Interface IP-Address OK? Method Status Protocol
FastEthernet0/0 192.168.3.1 YES manual up up
FastEthernet0/1 unassigned YES unset administratively down down
Serial0/0/0 192.168.2.2 YES manual up up
Serial0/0/1 unassigned YES unset down down
Vlan1 unassigned YES manual administratively down down
```

If both interfaces are **up** and **up**, then both routes will be in the routing table. Verify this again by using the **show ip route** command.

Step 3: Test connectivity.
Test connectivity by pinging from each host to the default gateway that has been configured for that host.

Answer the question no. 10-15 in the given question sheet

Step 4: Test connectivity between router R1 and R2.

Answer the question no. 16-22 in the given question sheet

Task 7: Reflection

Step 1: Attempt to ping from the host connected to R1 to the host connected to R2.
This ping should be unsuccessful.
Step 2: Attempt to ping from the host connected to R1 to router R2.
This ping should be unsuccessful.
Step 3: Attempt to ping from the host connected to R2 to router R1.
This ping should be unsuccessful.

Answer the question no. 23 in the given question sheet

Task 8: Documentation

On each router, capture the following command output to a text (.txt) file and save for