Objective:

To understand the basic configuration of routers and switches, including switching and routing operations, and to practice basic commands for configuring and verifying networks.

Part 1: Basic Switch Commands

1. Accessing Switch

- Connect to the switch using a console cable or SSH.
- Use terminal emulation software (like PuTTY) to connect to the switch.

Command:

```
bash
Copy code
Switch>
```

This is the default user EXEC mode.

Command to enter privileged EXEC mode:

```
bash
Copy code
Switch> enable
Switch#
```

2. Basic Configuration Mode

To enter global configuration mode:

```
bash
Copy code
Switch# configure terminal
Switch(config)#
```

3. Set Hostname

Command:

```
bash
Copy code
Switch(config)# hostname SW1
SW1(config)#
```

4. Assign IP Address to a VLAN (Interface VLAN 1)

Command:

```
bash
Copy code
SW1(config)# interface vlan 1
SW1(config-if)# ip address 192.168.1.2 255.255.255.0
SW1(config-if)# no shutdown
```

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

5. Configuring Default Gateway

Command:

```
bash
Copy code
SW1(config)# ip default-gateway 192.168.1.1
```

6. Saving Configuration

Command:

```
bash
Copy code
SW1# copy running-config startup-config
```

7. Verify Configuration

Commands:

- To verify the IP configuration:

  ```
  bash
  Copy code
  SW1# show ip interface brief
  ```

- To check the running configuration:

  ```
  bash
  Copy code
  SW1# show running-config
  ```

8. Basic VLAN Commands

- To create a VLAN:

  ```
  bash
  Copy code
  SW1(config)# vlan 10
  SW1(config-vlan)# name Sales
  ```

- To assign a port to a VLAN:

  ```
  bash
  Copy code
  SW1(config)# interface fastEthernet 0/1
  SW1(config-if)# switchport mode access
  SW1(config-if)# switchport access vlan 10
  ```

Part 2: Basic Router Commands

1. Accessing Router

- Connect using a console cable or SSH to the router and open terminal emulation software.

Command to access user EXEC mode:

```
bash
Copy code
Router>
```

Command to enter privileged EXEC mode:

```
bash
Copy code
Router> enable
Router#
```

2. Enter Global Configuration Mode

Command:

```
bash
Copy code
Router# configure terminal
Router(config)#
```

3. Set Hostname

Command:

```
bash
Copy code
Router(config)# hostname R1
R1(config)#
```

4. Assign IP Address to an Interface

Command:

```
bash
Copy code
R1(config)# interface gigabitethernet 0/0
R1(config-if)# ip address 192.168.1.1 255.255.255.0
R1(config-if)# no shutdown
R1(config-if)# exit
```

5. Configuring Routing (Static Route)

Command:

```
bash
Copy code
R1(config)# ip route 192.168.2.0 255.255.255.0 192.168.1.2
```

6. Configuring Dynamic Routing (RIP)

Command:

```
bash
Copy code
R1(config)# router rip
R1(config-router)# version 2
R1(config-router)# network 192.168.1.0
R1(config-router)# network 192.168.2.0
R1(config-router)# exit
```

7. Saving Configuration

Command:

```
bash
Copy code
R1# copy running-config startup-config
```

8. Verify Configuration

Commands:

- To verify the IP configuration of interfaces:

  ```
  bash
  Copy code
  R1# show ip interface brief
  ```

- To display the routing table:

  ```
  bash
  Copy code
  R1# show ip route
  ```

- To display the running configuration:

  ```
  bash
  Copy code
  R1# show running-config
  ```

Conclusion:

This lab covers the basics of configuring switches and routers, including setting up IP addresses, static/dynamic routing, VLANs, and saving configurations.