IP Routing

Introduction

- IP Routing is a process of communicating two or more different IP based networks.
- WAN connects different LANs with each other to communicate and to share the data and resources.
- For this, IP Routing should be enabled on routers. Routers must learn the destinations that are not directly connected by building and maintaining routing tables.
- Once the routing table is built, the router switches packets by matching the destination address of an incoming packet with the “longest match” in the routing table.

IP Routing Types

- Static Routing
- Dynamic Routing
- Default Routing

Static Routing

- Static Routing is the most reliable type of routing, although it is not very scalable.
- It is suitable for small internetwork.
- It uses a route that a network administrator enters into the router manually.
- The static IP Routing enabled no extra overhead and the ***cost*** of the network is comparatively reduced. So it will not cost much, because it does not require much ***CPU processes*** and ***Bandwidth*** on the network links comparatively.

Commands to configure Static Routing

Router(config)# ip route <Destination Network address> <Subnet Mask> <Next Hop Address>

Prefix	IP route prefix for the destination
Mask	Prefix mask for the Destination
Address	IP address of the next hop that can be used to reach that network
Interface	Network interface to use
Distance	An Administrative Distance (optional)
Permanent	Specifies that the route will not removed, even if the interface shuts down

An Internetwork

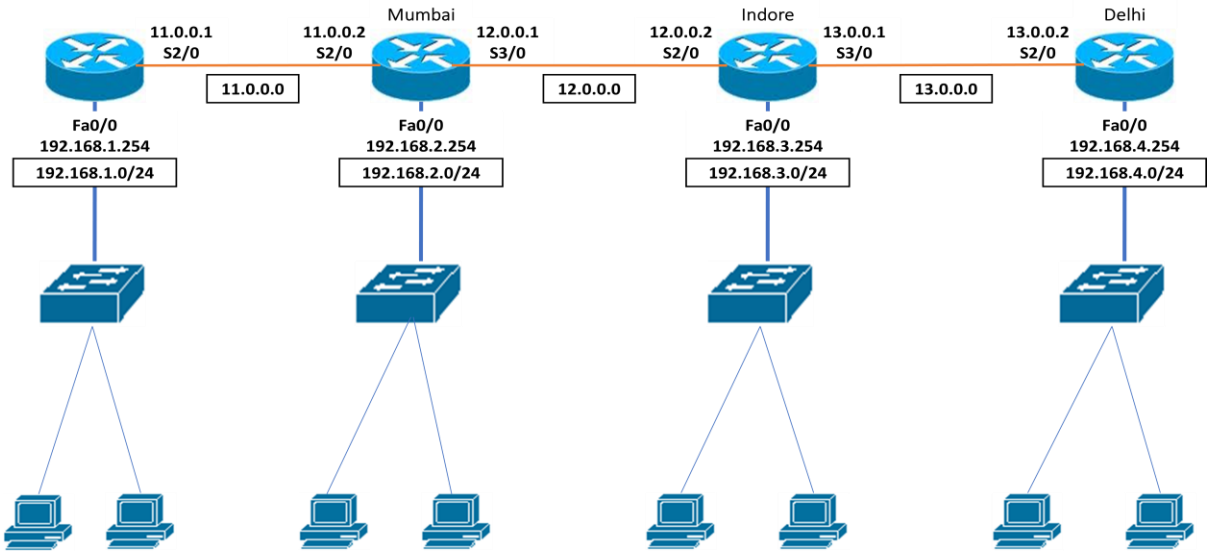

Figure - **An Internetwork**

Configuring the figure "An Internetwork" with Static Routing

Bhopal Router Configuration

```
Bhopal(config)# ip route 192.168.2.0 255.255.255.0 11.0.0.2
Bhopal(config)# ip route 192.168.3.0 255.255.255.0 11.0.0.2
Bhopal(config)# ip route 192.168.4.0 255.255.255.0 11.0.0.2
Bhopal(config)# ip route 12.0.0.0 255.0.0.0 11.0.0.2
Bhopal(config)# ip route 13.0.0.0 255.0.0.0 11.0.0.2
```

Mumbai Router Configuration

```
Mumbai(config)# ip route 192.168.1.0 255.255.255.0 11.0.0.1
Mumbai(config)# ip route 192.168.3.0 255.255.255.0 12.0.0.2
Mumbai(config)# ip route 192.168.4.0 255.255.255.0 12.0.0.2
Mumbai(config)# ip route 13.0.0.0 255.0.0.0 12.0.0.2
```

Indore Router Configuration

```
Indore(config)# ip route 192.168.1.0 255.255.255.0 12.0.0.1
Indore(config)# ip route 192.168.2.0 255.255.255.0 12.0.0.1
Indore(config)# ip route 192.168.4.0 255.255.255.0 13.0.0.2
Indore(config)# ip route 11.0.0.0 255.0.0.0 12.0.0.1
```

Delhi Router Configuration

```
Delhi(config)# ip route 192.168.2.0 255.255.255.0 13.0.0.1
Delhi(config)# ip route 192.168.3.0 255.255.255.0 13.0.0.1
Delhi(config)# ip route 192.168.4.0 255.255.255.0 13.0.0.1
Delhi(config)# ip route 11.0.0.0 255.0.0.0 13.0.0.1
Delhi(config)# ip route 12.0.0.0 255.0.0.0 13.0.0.1
```