



What is Routing?

Routing is the process of **selecting a path** for traffic in a network and **forwarding data packets** from the source to the destination across networks.

- Happens in **routers**, which read the destination IP address in a packet and decide **where to send it next**.
- Routers use **routing tables** to determine the best path.

🧠 Example: When you open a website, routers help your request reach the correct server through the internet.



Types of Routing

Type	Description	Example
Static Routing	Routes are manually configured by admins	Used in small networks
Dynamic Routing	Routers share info with each other automatically	Used in large networks
Default Routing	A single route used when no specific path exists	Internet access from LAN



Routing Protocols

These are **rules used by routers** to exchange routing information and determine the best path.

◆ 1. RIP (Routing Information Protocol)

- Oldest dynamic protocol, uses **hop count**
- Max hop limit: **15**
- Type: **Distance Vector**

◆ 2. OSPF (Open Shortest Path First)

- Uses **link-state** routing
- Chooses path with **lowest cost**
- **Faster** and more scalable than RIP
- Used in **large enterprise networks**

◆ 3. EIGRP (Enhanced Interior Gateway Routing Protocol) – Cisco proprietary

- Hybrid of distance vector + link state
- Faster and more efficient than RIP/OSPF (in Cisco-only networks)

◆ 4. BGP (Border Gateway Protocol)

- Used for **routing between different ISPs or across the internet**
- Type: **Path Vector Protocol**
- Complex but **highly scalable**



Summary Table of Routing Protocols

Protocol	Type	Use Case	Metric Used
RIP	Distance Vector	Small networks	Hop Count
OSPF	Link State	Enterprise-level LANs	Cost
EIGRP	Hybrid (Cisco)	Cisco enterprise networks	Bandwidth, Delay
BGP	Path Vector	Internet / ISP-level routing	Path Attributes