CSS2C08

COMPUTER NETWORKS

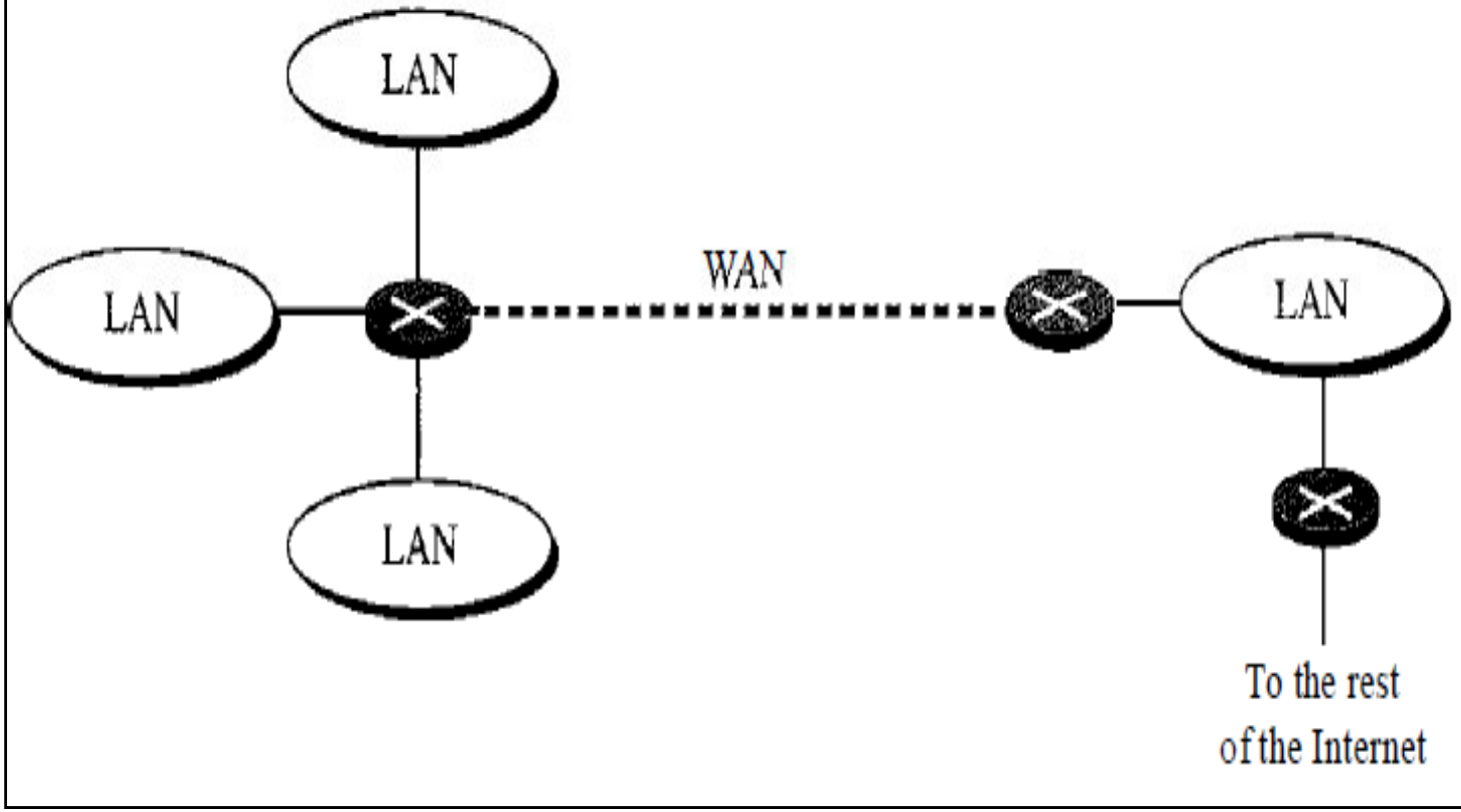
MODULE 3

1. Network layer services
2. Routing
3. IP
4. Routing in internet
5. Router
6. IPV6
7. Multicast routing
8. Mobility

ROUTER

- A router is a three-layer device that routes packets based on their logical addresses (host-to-host addressing).
- A router normally connects LANs and WANs in the Internet and has a routing table that is used for making decisions about the route.
- The routing tables are normally dynamic and are updated using routing protocols.

Routers connecting independent LANs and WANs



➢ Features of Router

- ❖ A router works on the 3rd layer (Network Layer) of the OSI model, and it is able to communicate with its adjacent devices with the help of IP addresses and subnet.
- ❖ A router provides high-speed internet connectivity with the different types of ports like gigabit, fast-Ethernet, and STM link port.
- ❖ It allows the users to configure the port as per their requirements in the network.
- ❖ Routers' main components are central processing unit (CPU), flash memory, RAM, Non-Volatile RAM, console, network, and interface card.

- Routers are capable of routing the traffic in a large networking system by considering the sub-network as an intact network.
- Routers filter out the unwanted interference, as well as carry out the data encapsulation and decapsulation process.
- Routers provide the redundancy as it always works in master and slave mode.
- It allows the users to connect several LAN and WAN.
- Furthermore, a router creates various paths to forward the data.

- **How does Router work?**
  - A router analyzes a destination IP address of a given packet header and compares it with the routing table to decide the packet's next path. The list of routing tables provides directions to transfer the data to a particular network destination. They have a set of rules that compute the best path to forward the data to the given IP address.
  - Routers use a modem to allow communication between other devices and the internet. Most of the routers have several ports to connect different devices to the internet at the same time. It uses the routing tables to determine where to send data and from where the traffic is coming.

- A routing table mainly defines the default path used by the router. So, it may fail to find the best way to forward the data for a given packet. For example, the office router along a single default path instructs all networks to its internet services provider.
- There are two types of tables in the router that are static and dynamic. The static routing tables are configured manually, and the dynamic routing tables are updated automatically by dynamic routers based on network activity.

- **Routing Protocols**
  - Routing protocols specify a way for the router to identify other routers on the network and make dynamic decisions to send all network messages.
  - There are several protocols, which are given below:
    - Routing Information Protocol (RIP)
    - Open Shortest Path First (OSPF)
    - Border Gateway Protocol (BGP)