FIFTH EDITION

Data Communications AND Networking

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Data Link Layer

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Lecture 9: Data Link Layer

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LINK-LAYER ADDRESSING

– A *link-layer address* is sometimes called a *link address*, sometimes a *physical address*, and sometimes a *MAC address*. media access control address (MAC address)

– MAC address is 6bytes format.
  • Example (A3:34:45:11:92:F1)
  • A3:34:45 = Company ID.
  • 11:92:F1 = NIC number. (network interface controller)

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Address Resolution Protocol (ARP)

– ARP protocol is used to find the MAC address of a host using host IP address.

– ARP broadcasts a request message contains [sender IP + Sender MAC + Receiver IP + Receiver MAC = FF:FF:FF:FF:FF:FF] to all hosts.

– The host whose IP address matches the receiver IP will reply with its MAC address.
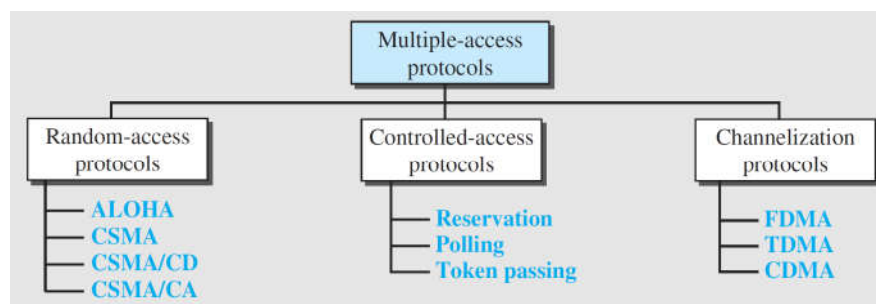
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Switch Self Learning

– Switches only Checks MAC address of frames received from ports.

– If the destination MAC is found in the MAC Table

– So, Switches have a table Called MAC Table.

– When a switch receives a frame from a port it records the MAC number of frame and the port number in its MAC table.

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Media Access Control Protocols

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CSMA

– Carrier sense multiple access (CSMA) is one of the random access protocols.

– CSMA is used in Ethernet.

– CSMA Steps used by any station:
1. Listening to the link (Carrier)
2. If the link is not busy the station sends data immediately.
3. If the link is busy the station selects a random value to countdown until reaches Zero the station tries again.

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Thank You

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