Module 1: Data Communication Components - 2

Advantages of ring topology

① Easy to install — device is linked only to its immediate neighbors. (only constraint — media (max. ring length) and traffic considerations (no. of devices)

② Fault identification is easy (device not receiving signal can raise alarm).
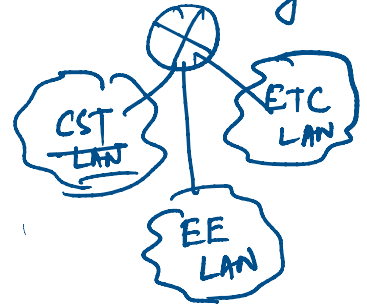
Disadvantage

① Break in the ring (or a disabled device) can disable the network.

✓ Prevalent when IBM introduced its local-area network (Token ring).

Local Area Network (LAN)

✓ Each host — identifier/address — unique identification.
                                    (Hardware address)

✓ Packet sent by a host to another host carries both the source and destination addresses.

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LAN	WAN
① Limited in size, spanning an office, a building, or a campus.	① Wider geographical span (city, state, country)
② Interconnects hosts	② Interconnects network devices (routers, gateways, or modems)
③ Privately owned.	③ Created and run by communication companies and leased to an organization that uses it.

Hierarchical organization of the Internet

ISP {
- Backbone — large networks owned by some communication companies like Sprint, Verizon, AT&T, and so on.

- Peering point — complex switching system that connects several backbone networks
  → national/regional ISPs.

- Provider network — smaller networks — uses the services of backbones for a fee.
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- **Customer network** — networks at the edge of the Internet, use the services provided by the Internet by paying fees to provider network.

Protocol Elements.

① Syntax — structure/format of the data; indicates how to read the bits.

② Semantics — interpretes the meaning of the data; which field defines what action.

③ Timing — when data should be sent; speed at which data should be sent/received.