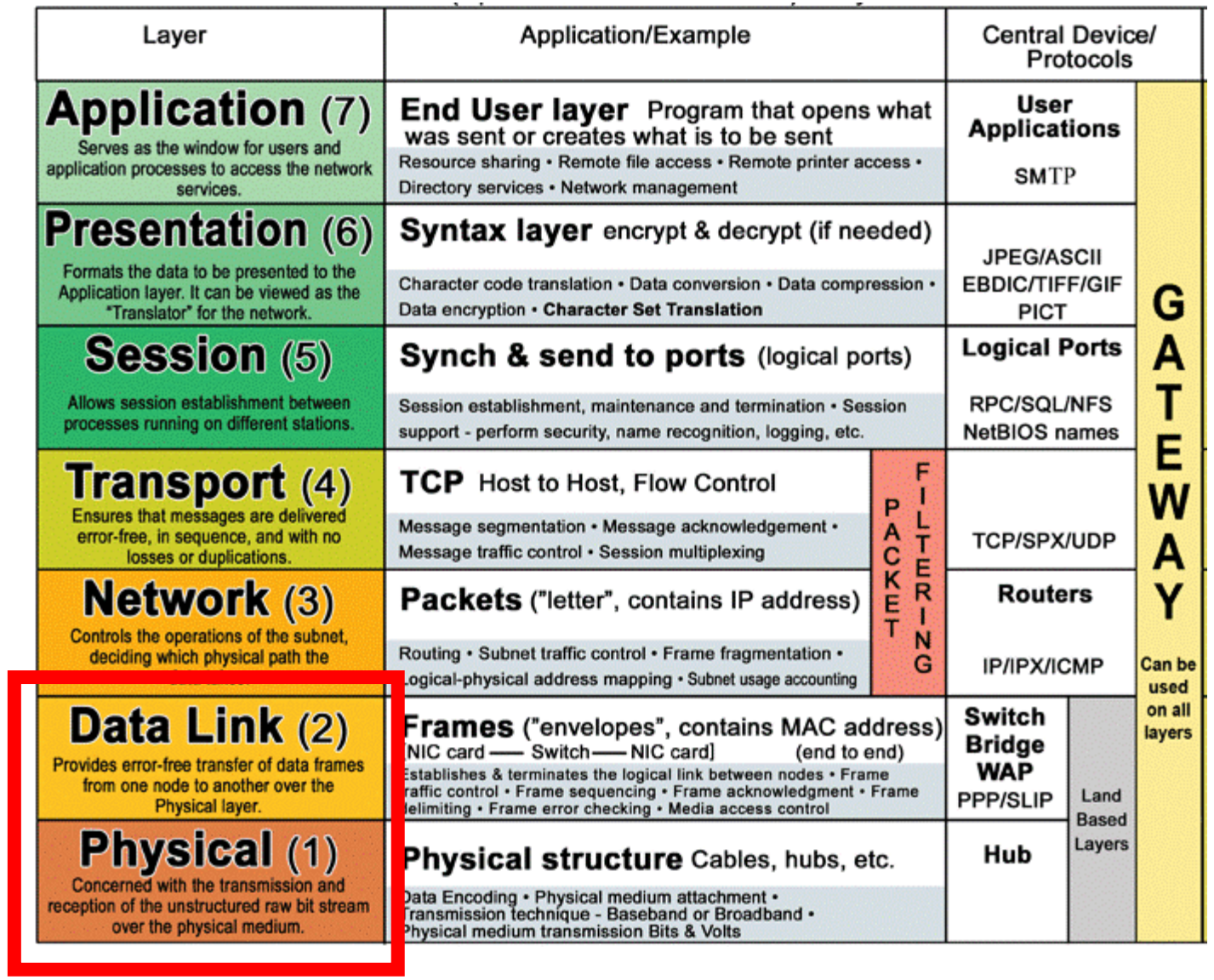
a mini session on

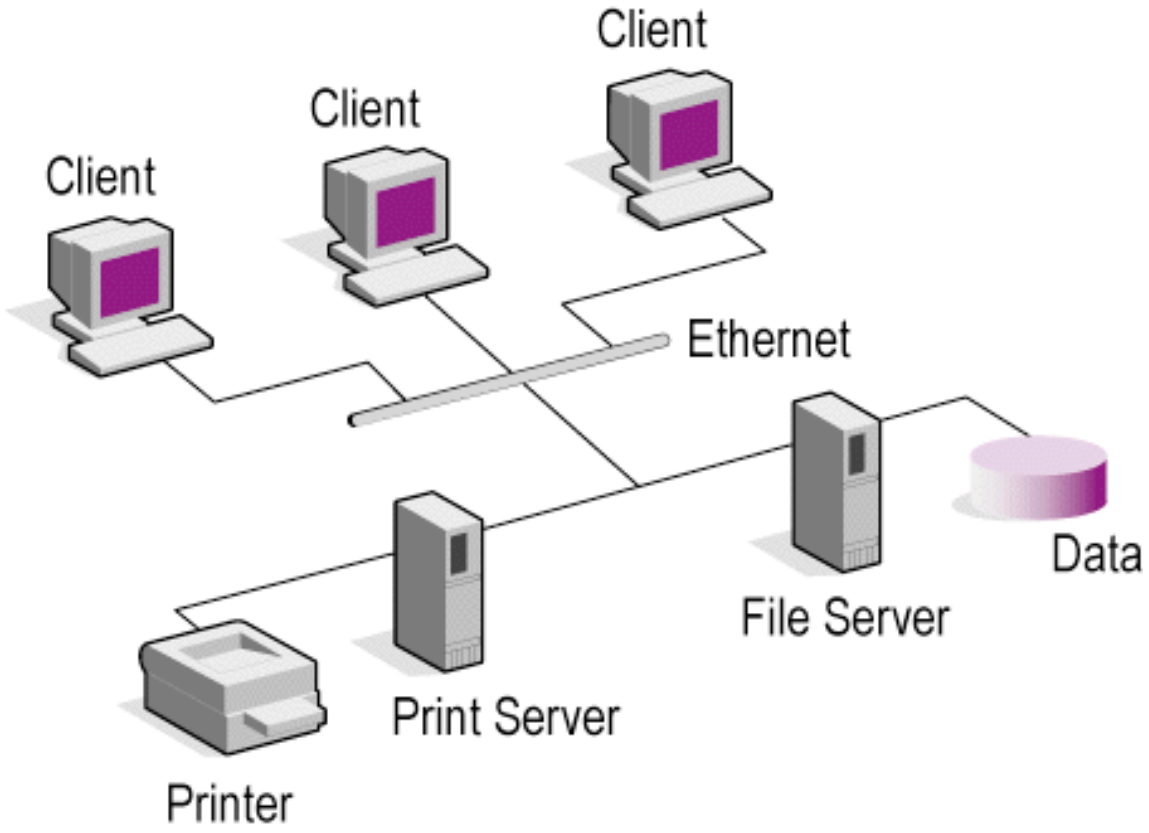
NETWORK INFRASTRUCTURE

NETWORKING HARDWARE



Layer	Application/Example		Central Device/ Protocols	
Application (7) Serves as the window for users and application processes to access the network services.	**End User layer** Program that opens what was sent or creates what is to be sent Resource sharing • Remote file access • Remote printer access • Directory services • Network management		**User Applications** SMTP	**GATEWAY** Can be used on all layers
Presentation (6) Formats the data to be presented to the Application layer. It can be viewed as the "Translator" for the network.	**Syntax layer** encrypt & decrypt (if needed) Character code translation • Data conversion • Data compression • Data encryption • **Character Set Translation**		JPEG/ASCII EBDIC/TIFF/GIF PICT	
Session (5) Allows session establishment between processes running on different stations.	**Synch & send to ports** (logical ports) Session establishment, maintenance and termination • Session support - perform security, name recognition, logging, etc.		**Logical Ports** RPC/SQL/NFS NetBIOS names	
Transport (4) Ensures that messages are delivered error-free, in sequence, and with no losses or duplications.	**TCP** Host to Host, Flow Control Message segmentation • Message acknowledgement • Message traffic control • Session multiplexing	PACKET FILTERING	TCP/SPX/UDP	
Network (3) Controls the operations of the subnet, deciding which physical path the	**Packets** ("letter", contains IP address) Routing • Subnet traffic control • Frame fragmentation • Logical-physical address mapping • Subnet usage accounting		**Routers** IP/IPX/ICMP	
Data Link (2) Provides error-free transfer of data frames from one node to another over the Physical layer.	**Frames** ("envelopes", contains MAC address) [NIC card — Switch — NIC card] (end to end) Establishes & terminates the logical link between nodes • Frame traffic control • Frame sequencing • Frame acknowledgment • Frame delimiting • Frame error checking • Media access control		**Switch Bridge WAP** PPP/SLIP	Land Based Layers
Physical (1) Concerned with the transmission and reception of the unstructured raw bit stream over the physical medium.	**Physical structure** Cables, hubs, etc. Data Encoding • Physical medium attachment • Transmission technique - Baseband or Broadband • Physical medium transmission Bits & Volts		**Hub**	

Hosts and Nodes



What are Hosts ?

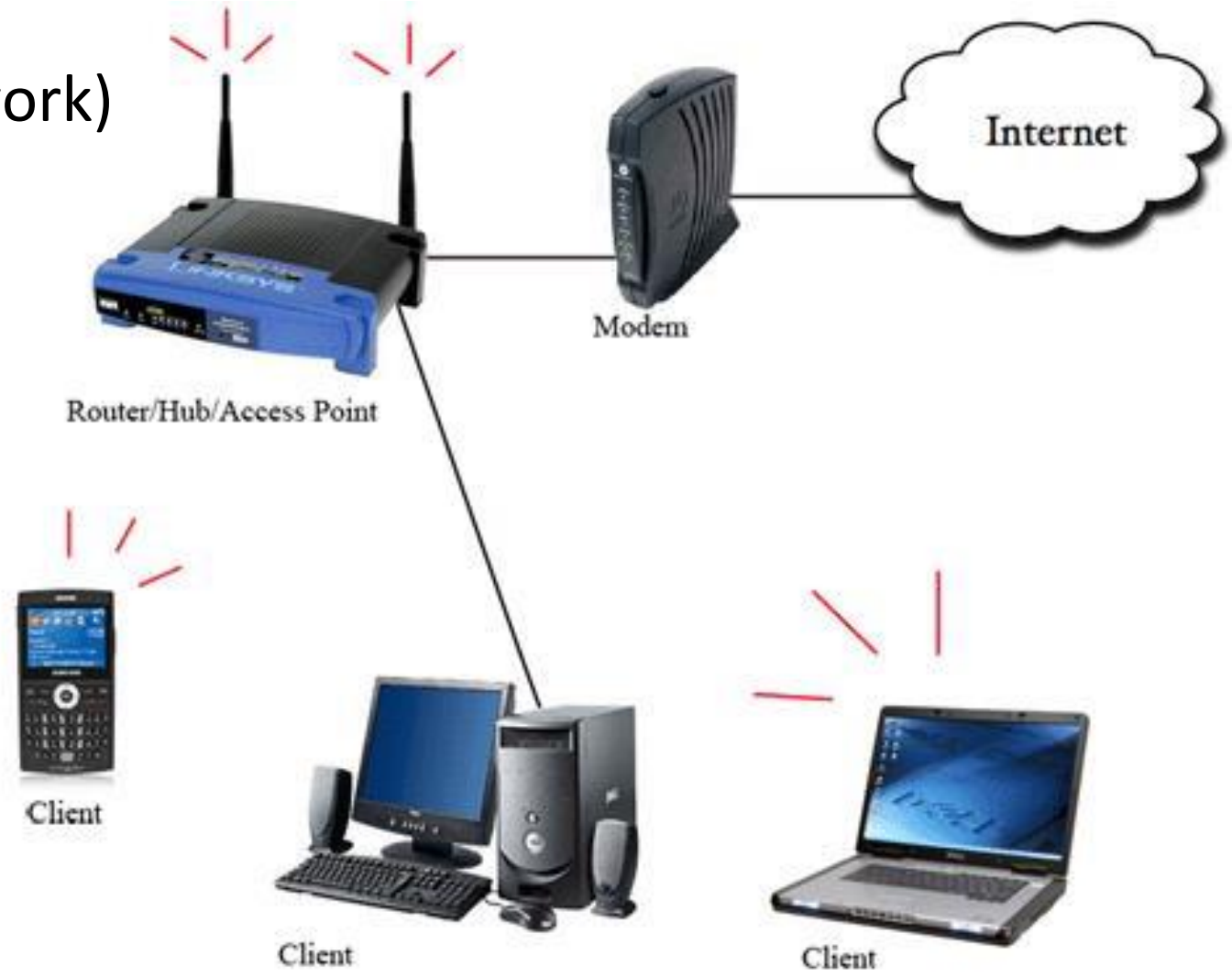
- Hosts are servers and clients

What are Nodes ?

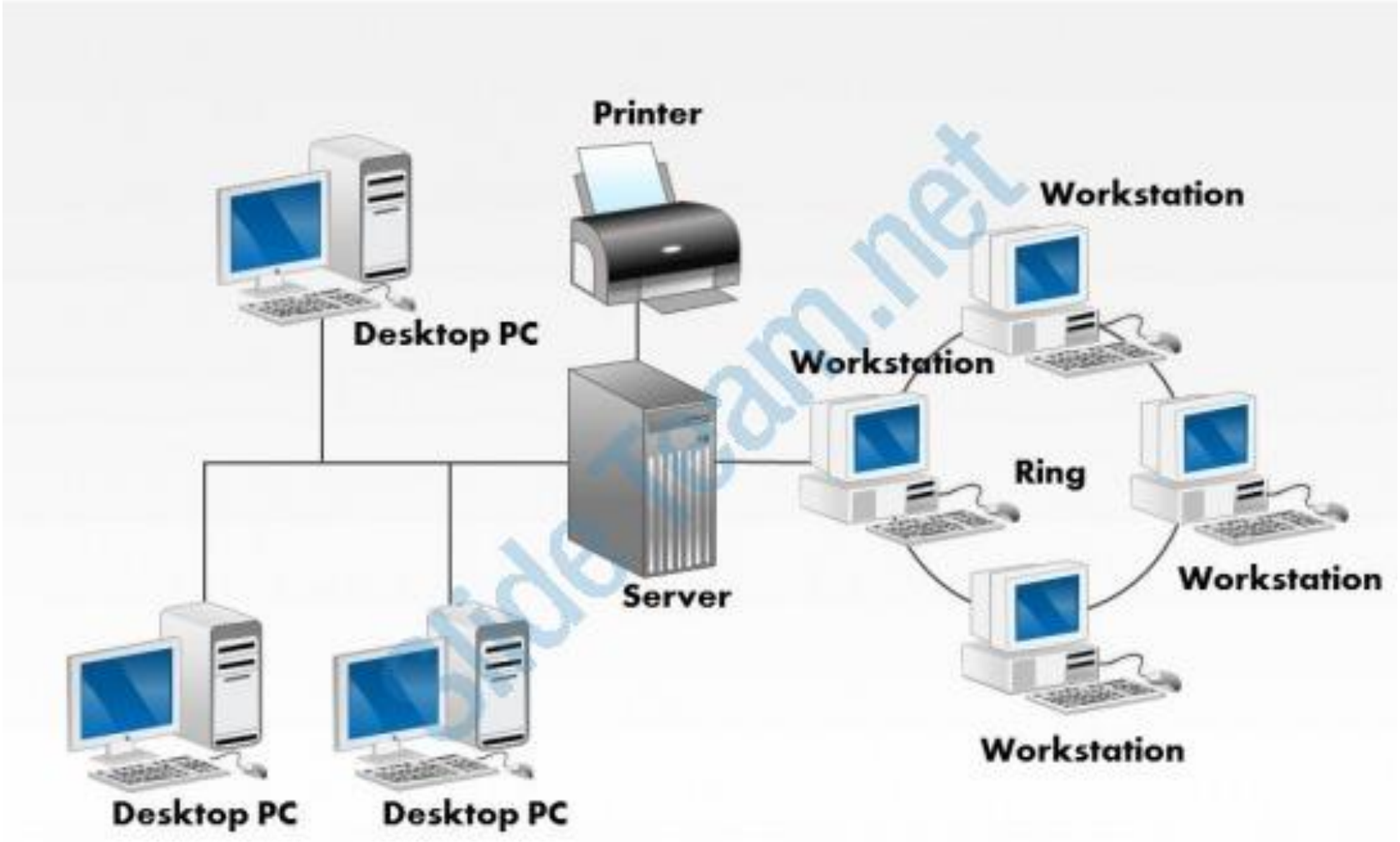
- Every network device must have at least one node
- Examples : Network Interface Card (NIC),
  Wifi, Bluetooth or Infrared Ports

Networking

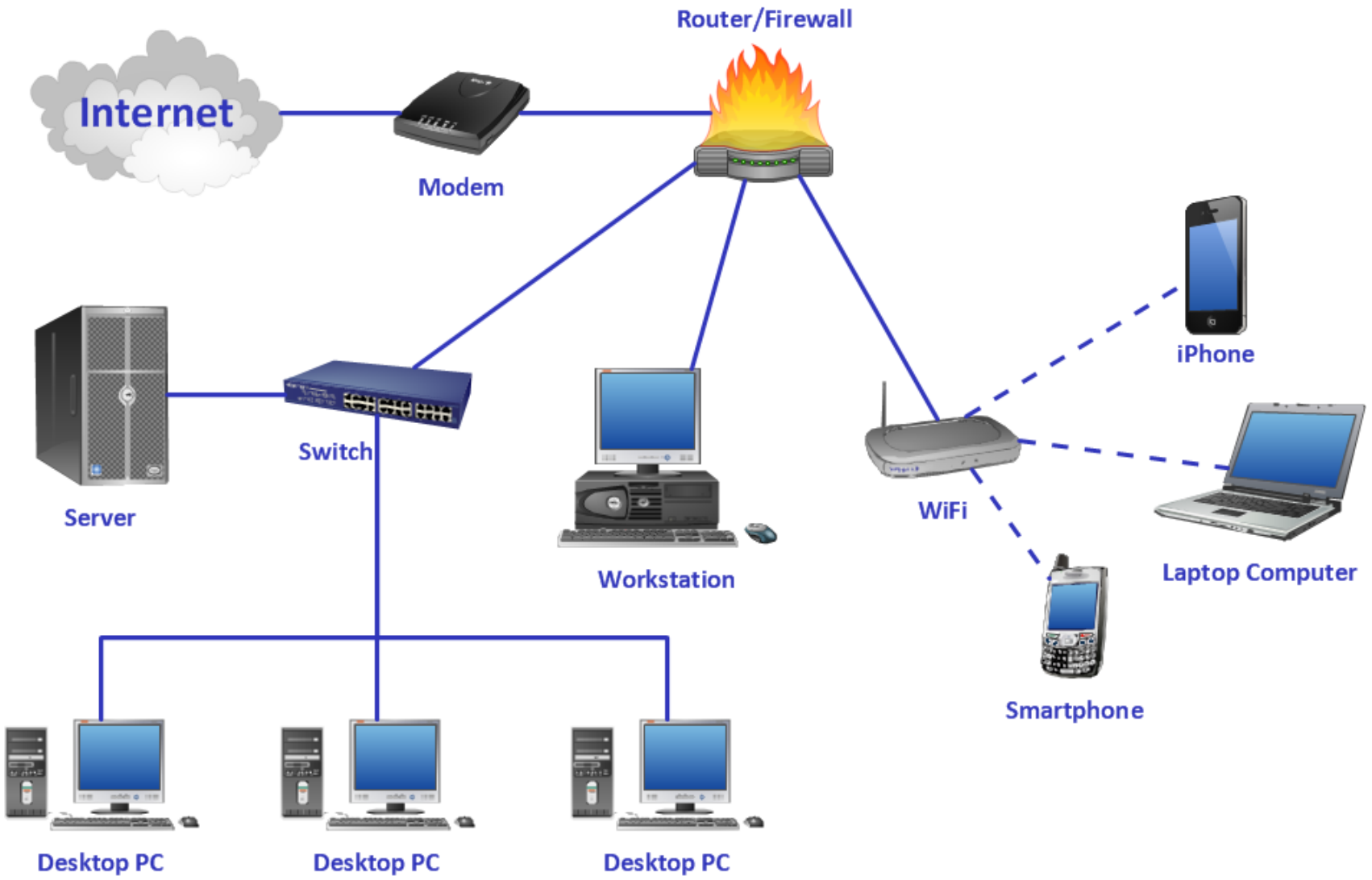
- Peer-to-Peer (a simplest network)
- Home Network



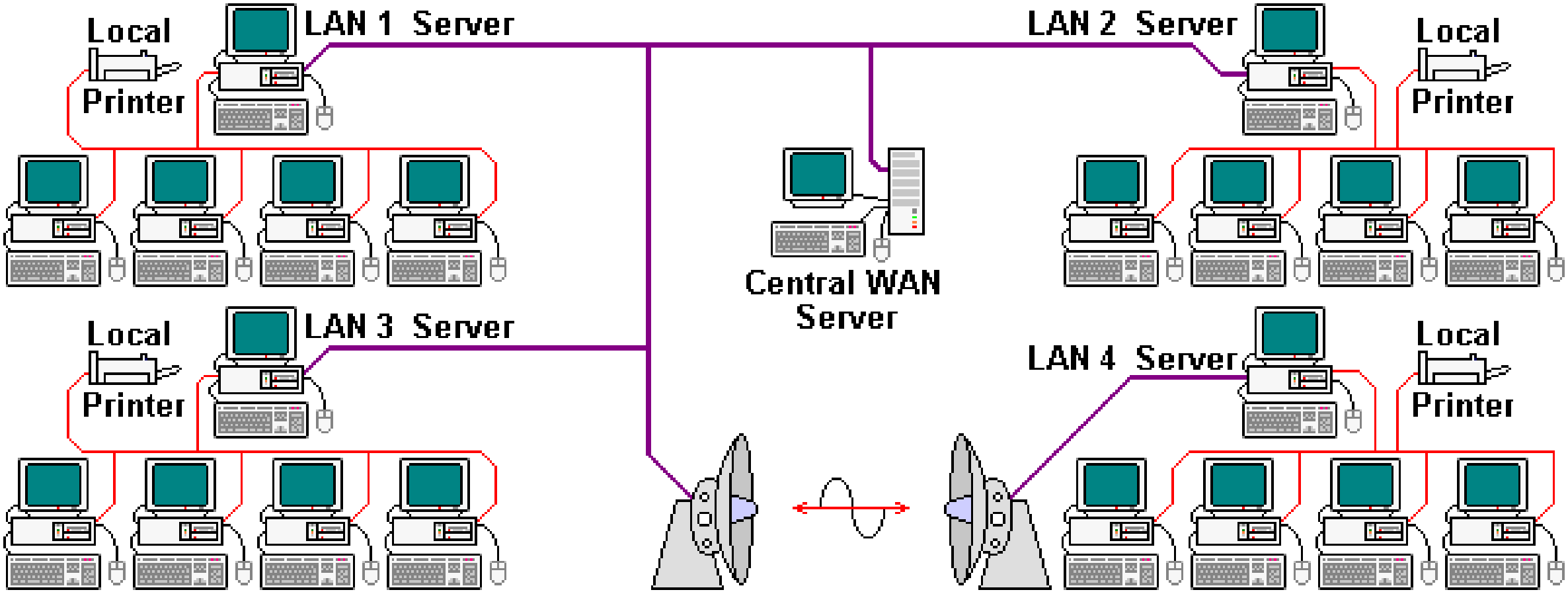
Local Area Network (LAN)



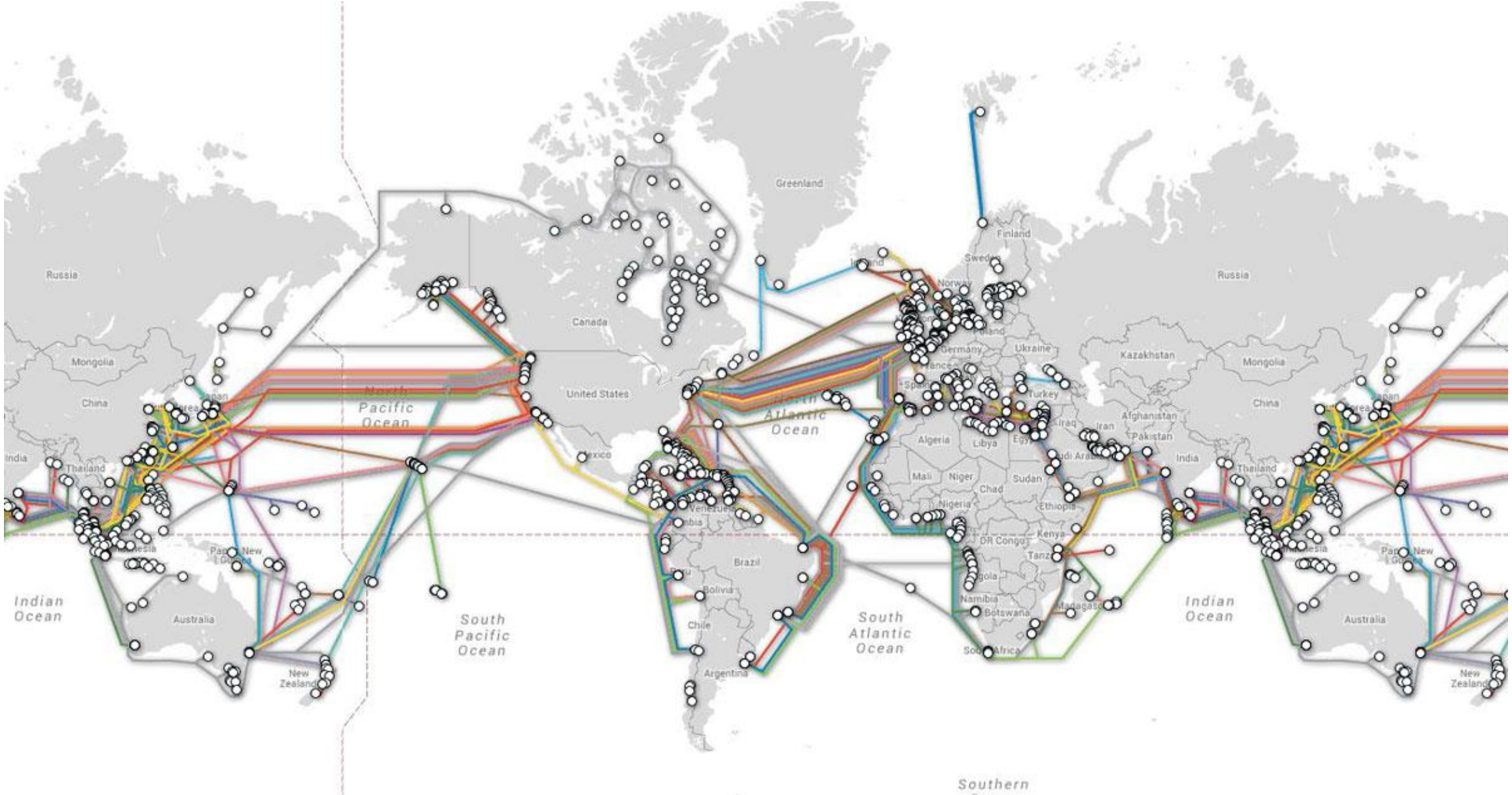
Enterprise Area Network



Wide Area Network (WAN)

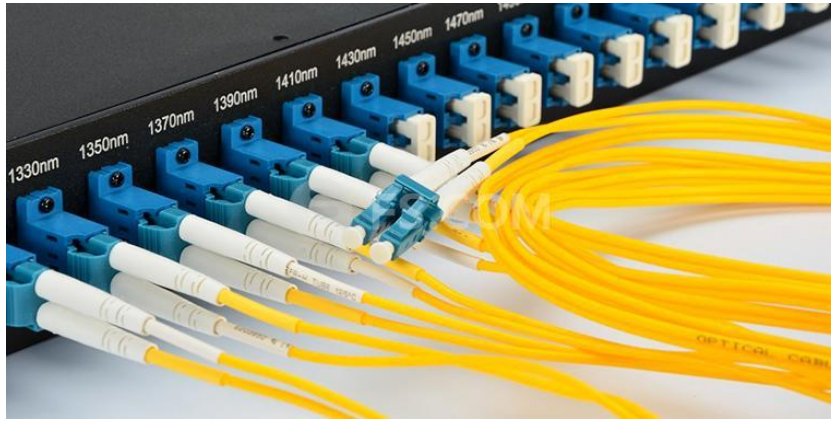


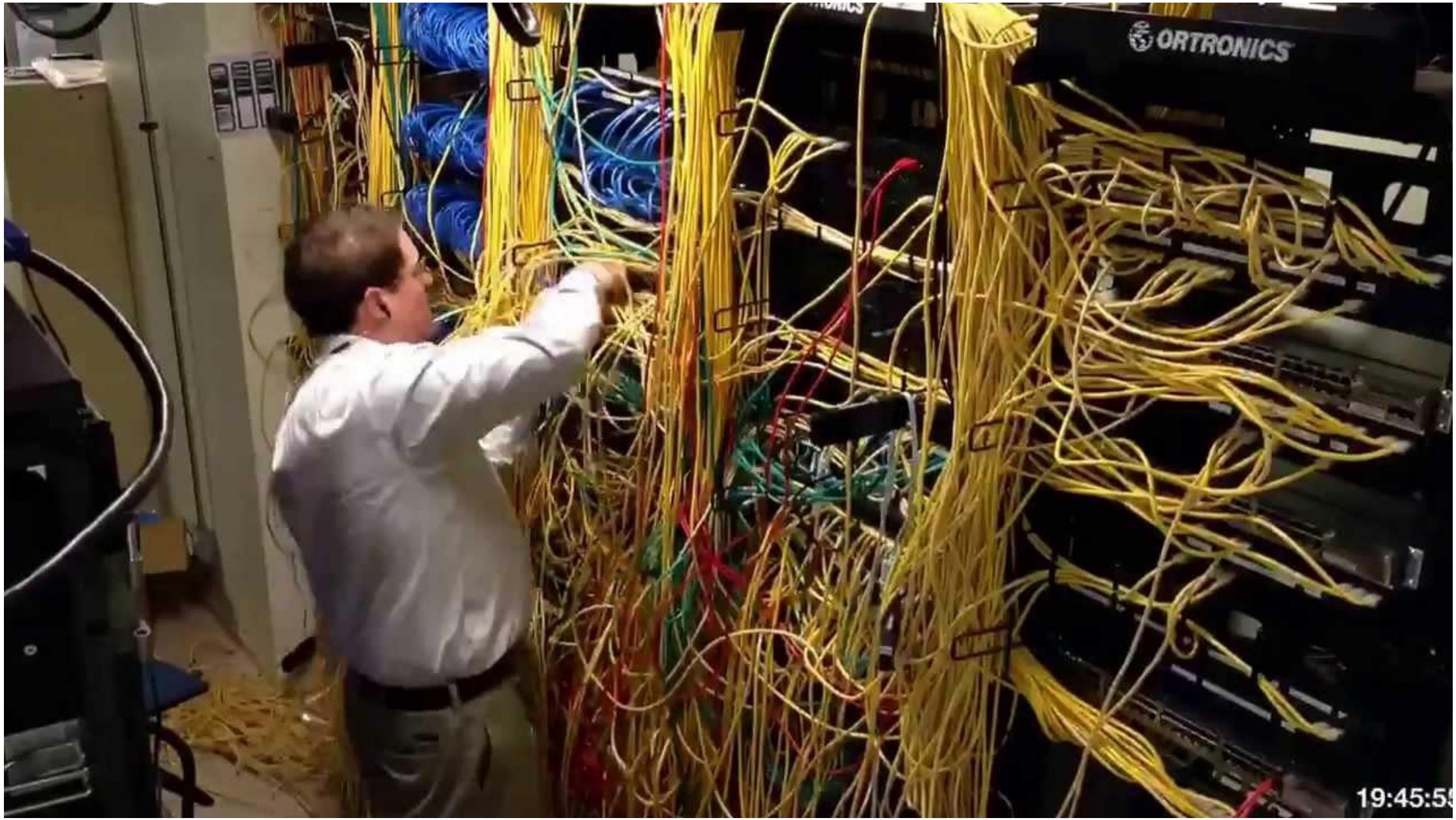
Metropolitan Area Network (MAN)



Network Devices

- Modem
- Router (with Wifi)
- Hub / Switch
- Servers / Client Workstations
- Network Printer
- Storage (SAN, NAS)
- RAID Redundancy or Backup Storage

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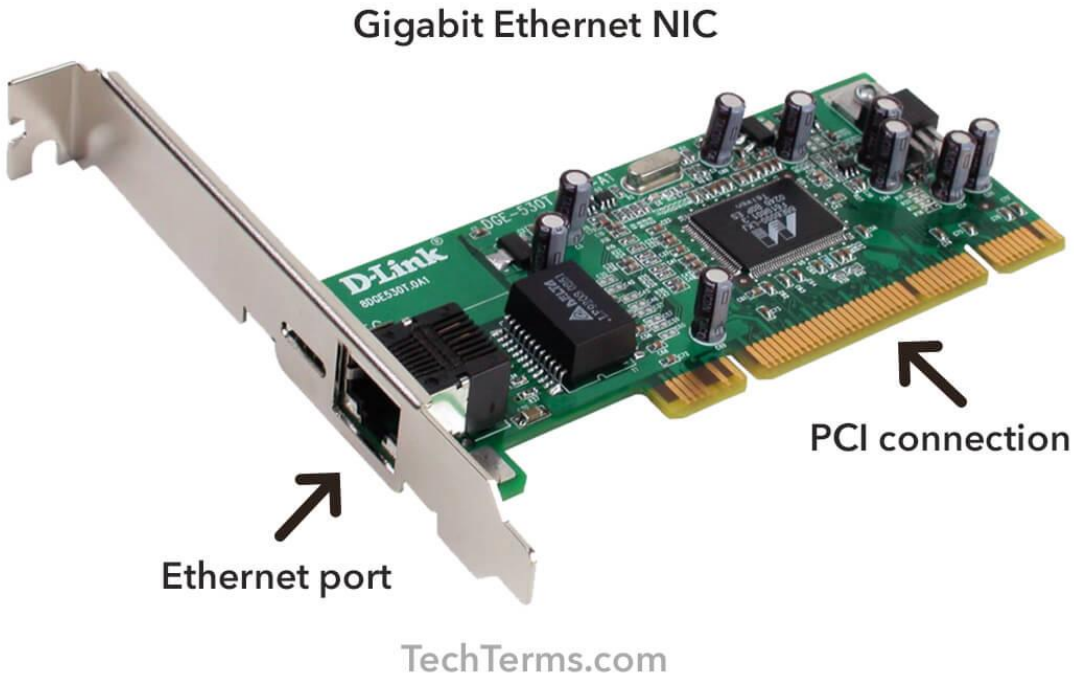
Network Medium Types

Network Interface Card (NIC)



Network Medium

RJ45