Introduction to Networking I

Host / End device : every computer on a network

Servers : Computers > provide info to end devices
(1) email servers
(2) web servers
(3) file servers

Clients : Computers > send requests to servers - to retrieve info
E.g. (1) Web page from a web server
(2) Email from an email server

Peer-to-peer Network : one device - client & server at the same time

[Recommended for very small networks]
→ E.g. torrent devices

Advantages	Disadvantages
- Easy to set up - less complex - Lower cost - Used for simple tasks [transferring files / sharing printers]	- No centralized administration - Not as secure - Not scalable - Slower performance

End devices : where a message originates / where it is received
(e.g. PC, tablet, mobile phone, VoIP, laptop, printer, IoT)

Intermediary Network Devices → interconnects end devices [e.g. switches, WAP, routers, firewalls MLS Clayer 3)]

WAP = Wireless Access Points

Management of Data : (1) Regenerate / Retransmit data signals
(2) ARP table : maintain info about pathways exist in the network
(3) Errors / Communication failures notifications

Network Media : (1) Copper → uses electrical impulses

(2) Fiber-optic → uses pulses of light

(3) Wireless → uses modulation of specific frequencies of electromagnetic waves

Network Representations / Topology

- Use symbols to represent devices within the same network

Important Terms : (1) Network Interface Card (NIC)
(2) Physical Port / Interface
(3) Logical Port / Interface

Physical Topology : Illustrate (1) Physical location of intermediary devices and (2) Cable installation

Logical Topology : Illustrate (1) Devices, (2) Ports and (3) Addressing scheme of the network

Networks of Many Sizes

Small Home : connect a few computers (to each other / to the Internet)

SOHO [Small Office /] → enables computers within a home / remote office to connect to a corporate network

[Home Office]

Medium / Large Networks : Many locations + hundreds / thousands of interconnected computers

World Wide Networks : Connects hundreds of millions of computers world-wide (e.g. Internet)

LANs & WANs

Net infrastructures vary greatly in :
(1) Area size covered
(2) Number of users connected
(3) Number / types of services available
(4) Responsibility area

Two most common types of networks : Local Area Network (LAN)
Wide Area Network (WAN)

LAN	WAN
- Interconnects end devices in a limited area	- Interconnects LANs over wide geographical area
- Administered by a single organization / individual	- Typically administered by one / more service providers
- Provide high-speed bandwidth to internal devices	- Typically provide slower speed links between LANs

The Internet

- A worldwide collection of interconnected LANs & WANs

① LANs are connected using WANs

② WANs may use copper wires / fiber-optic cables / wireless transmission

* Not owned by any individual group

To help maintain structure on the internet ⟶
(1) IETF
(2) ICANN
(3) IAB

The Internet : The World

Extranet : Suppliers , Customers , Collaborators

Intranet : Company only