1 | Explore The Network

Introduction

- Internet is super duper important

Network Sizes

- Small Home Networks
  - e.g. Sharing printers, documents, ...
- Small Office / Home Office Networks
  - e.g. Connect to your office from home
- Medium to Large Networks (Enterprise)
  - e.g. Consolidation, storage, access to information
  - e.g. Email, instant messaging, collaboration amongst employees
- World Wide Networks (WWW)
  - e.g. Internet

Hosts

- Computers connected to a network that participate directly in network communication
- End devices

Servers

- Computers with software that
  - Enable them to provide information to other end devices
  - e.g. Email, web pages
- Each service requires separate server software
- Can provide services to one or many clients
- A single computer can run multiple types of server software

Clients

- Computers with software (e.g. web browser) installed that
  - Enable them to request and display information obtained from server
- A single computer can run multiple types of client software

Types of Clients and Servers

- File Client and Server
- Web Client and Server
- Email Client and Server

Peer-to-Peer

P2P

- Client and server software usually runs on separate computers
- Also possible for one computer to carry out both roles

Advantages of P2P

- Easy setup
- Less complexity
- Lower cost (no dedicated servers, etc.)
- For simple tasks (file transfer, sharing printers, etc.)

Disadvantages of P2P

- No centralized administration
- Not as secure
- Not scalable
- Slower performance (all devices could be client and server)

3 Components of Network Infrastructure

- Devices
- Media
- Services

Processes

- Provide funktionaliy
- Direct and move messages through the network
- Less obvious to us but critical to the operation of networks

End Devices

- Source or destination of a message transmitted over network
- Distinguished by an address
- Use addresses to define where messages should be sent
- PC, Smartphone, etc.

Intermediary Network Devices

IND: Intermediary Network Devices

- Connect end devices to network
- Connect multiple networks to form an internetwork
- Provide connectivity
- Ensure data flows across the network

Examples of INDs

- (Wireless) Router
- LAN / Multilayer Switch
- Firewall Appliance

How do INDs work?

- Use destination end devices address and information about network interconnections to determine path of message through network

Function of INDs

- Regenerate and retransmit data signals
- Maintain info about existing pathways through (inter)network
- Notify other devices of errors and communication failures
- Direct data along alternate pathways if link failure
- Classify and direct messages according to priorities
- Permit or deny flow of data, based on security settings

Network Media

- Carries out communication accross a network
- Provides channel over which a message travels from source to destination

3 Basic Forms of Network Media

- Electrical Signals (Copper cable)
- Light Pulse (Fiber-optic cable)
- Microwave Signals (Wireless)

Network Representations

- Topology Diagram
- Important terms
  - Network Interface Card (NIC / LAN Adapter)
  - Physical Port
  - Interface

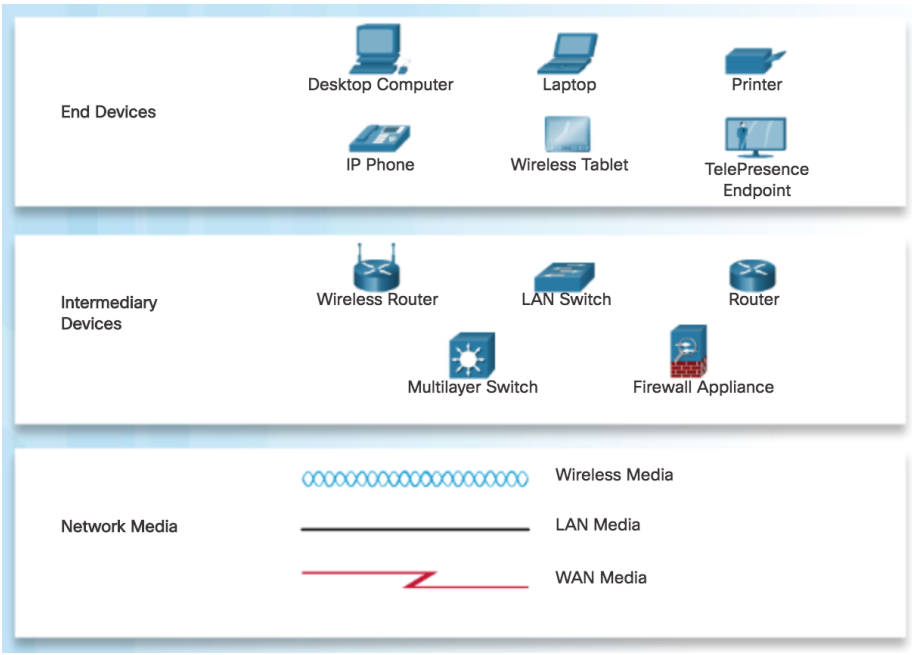

Figure 1: Screen Shot 2019-03-09 at 11.53.16