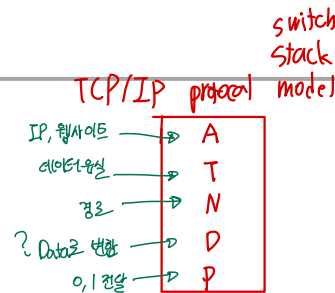
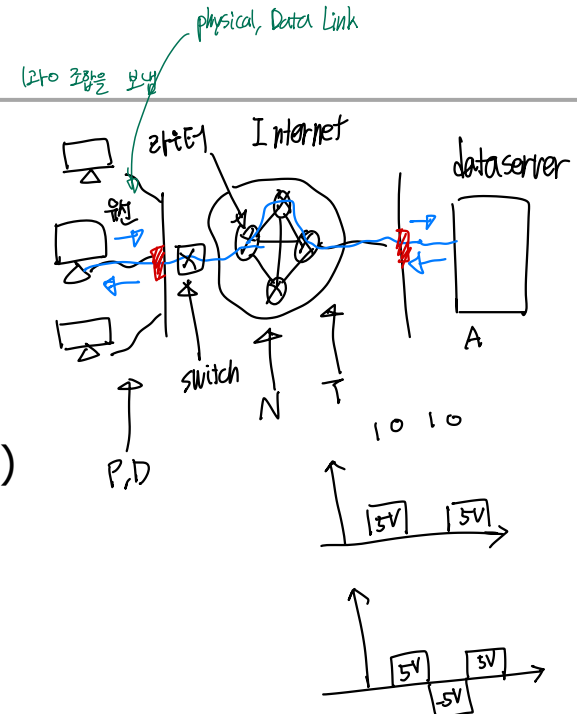


-Topology/Data Flow/Network Range-



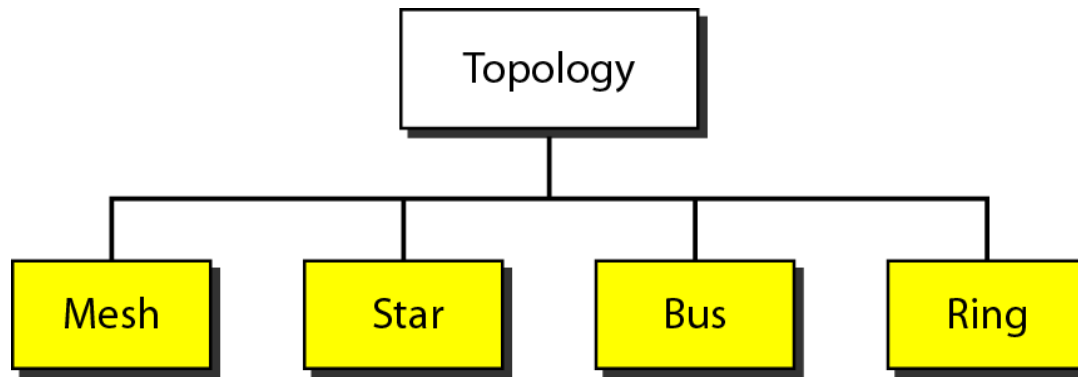
2024. 9. 10

Young Deok Park (박영덕)



Physical Topology 어떤 모양으로 연결되어 있는지

- The way in which a network is laid out physically
- Two or more devices connect to a link 배치되다
 - Two or more links form a topology

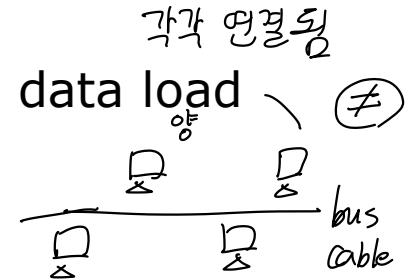
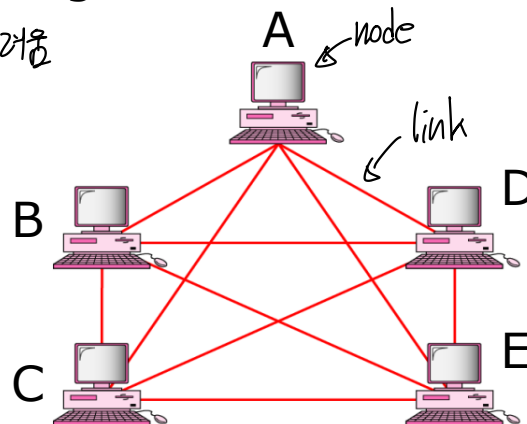
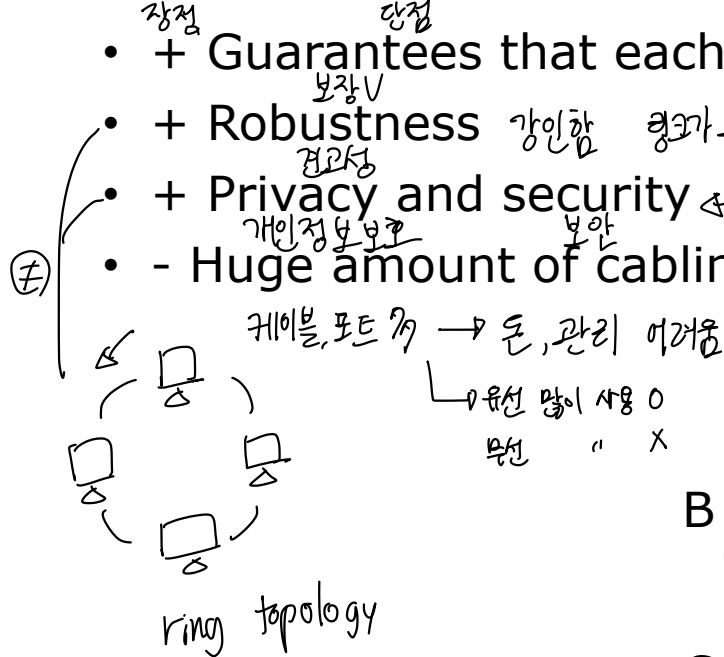


Fully Connected Mesh Topology

- Every devices (called node or station) has a dedicated point-to-point link to every other devices
 - Dedicated means that the link carries traffic only between the two devices it connects

Pros and cons

- + Guarantees that each connection can carry its own data load
- + Robustness
- + Privacy and security
- Huge amount of cabling and the number of I/O ports



! N 연결

Star Topology 유사사용

성형

- Each devices has a dedicated point-to-point link only to a central controller (generally called hub) 전용
- The devices are not directly linked to other devices
- A start topology does not allow direct traffic between devices 직접
- Used in local-area networks (LANs)

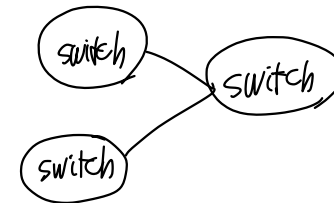
근거리 통신
지역

len cable

Pros and cons

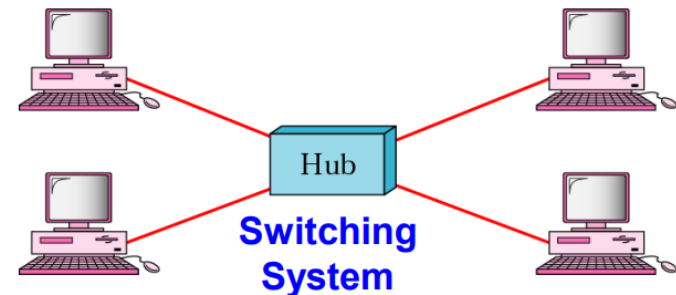
- + Less expensive than a mesh topology mesh보다 cable ↓
- + Robustness 끊어도 피해X
- If the hub goes down... ☹️

고장 나면 먹통, 하지만 고장 덜 남



추가적인 통신 장비 : 데이터 교환

switch에 연결 (계통적으로 연결)



Bus Topology

1960년대 사용 시작 사용

- Multipoint connection

다중점 연결

- One long cable acts as a backbone to link all the devices in a network

역할

중심 통신망

- Pros and cons

- + Easy of installation

- - Difficult reconnection and fault isolation

설치

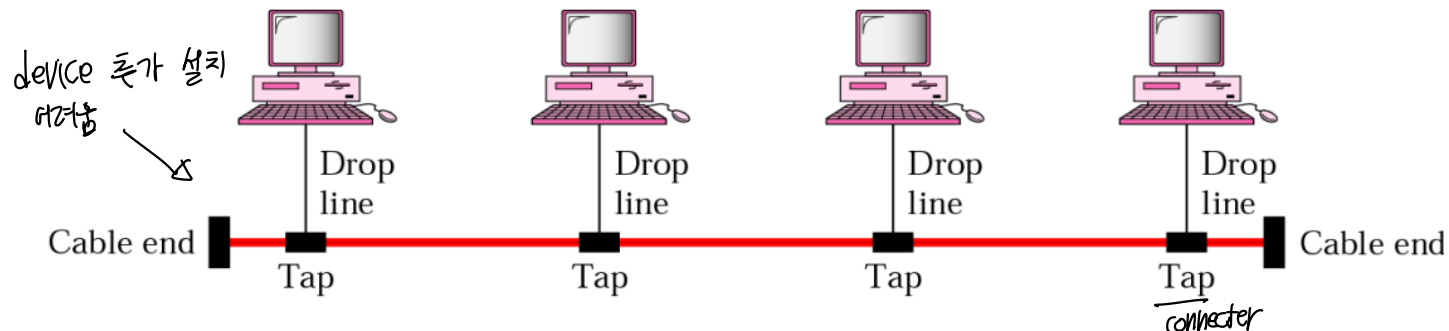
재연결

장소

과잉, 격리

- - A fault in the bus cable stops all transmission

오류



Ring Topology

반지형

- Each device has a dedicated point-to-point connection with only the two devices on either side of it
- A signal is passed along the ring in one direction, from device to device, until it reaches its destination

전용 양쪽에 있는

전달

따라

한 방향

에서

로

까지

한 방향으로만 설계 되어 있다

Pros and cons

- + Relatively easy to install and reconfigure
- Unidirectional traffic: A break in the ring (such as disabled node) can disable the entire network

재구성

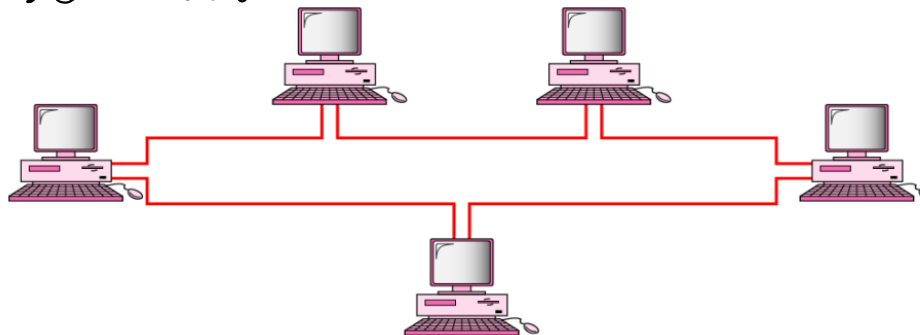
단방향

비활성화

전체

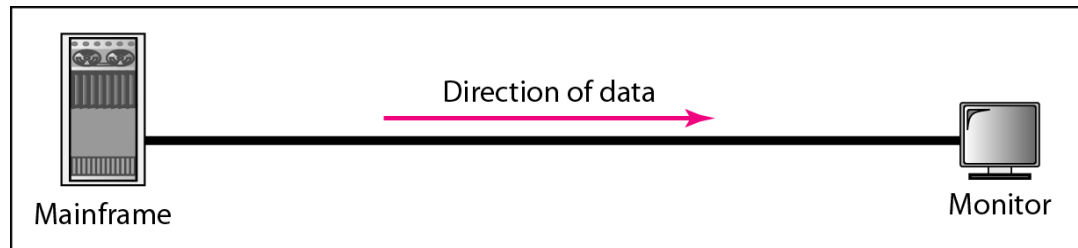
link 하나 고장나면 먹통 -> 보안하면 양방향

보안X



Data Flow

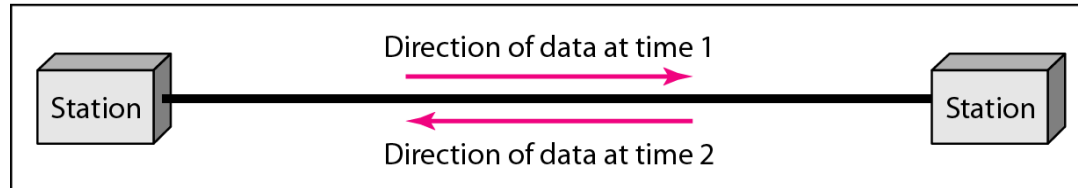
- Communication between two devices can be **simplex**, **half-duplex**, or **full-duplex**



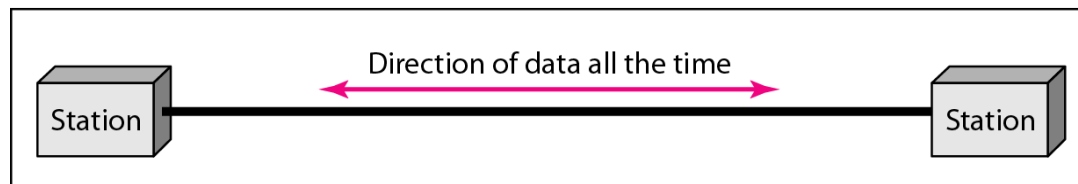
a. Simplex
단방향 통신



AP (와이파이) —



b. Half-duplex
반이중 통신 동시에 구체적인 시점엔 단방향, 전체적으로 양방향



c. Full-duplex
양방향 통신

Ethernet
이더넷 동시 수신

Network Range

^{신경망} BAN (Body Area Network) ^{나노, 센서}

- PAN (Personal Area Network) ^{개인, 사용자 중심 네트워크}
- LAN (Local Area Network) ^{기업, 홈 캠퍼스}
- MAN (Metropolitan Area Network) ^{광역시, 도시 대도시의}
- WAN (Wide Area Network) ^{국가}

