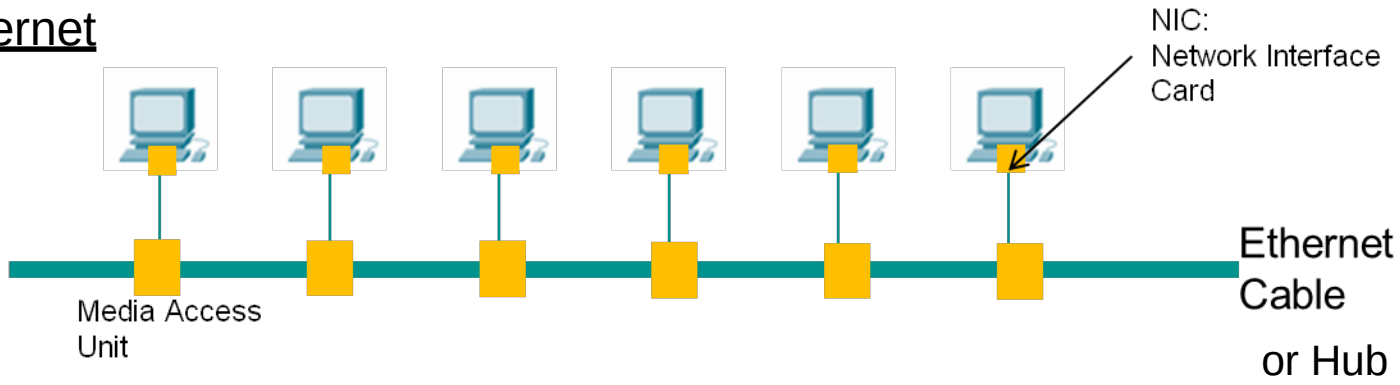
ALGONQUIN COLLEGE

Midterm Exam 1 REVIEW

Ethernet

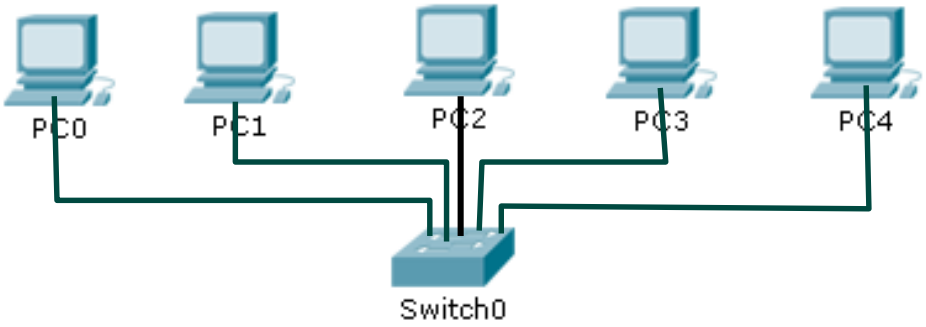
Legacy Ethernet

- CSMA/CD
- Half Duplex



Modern Ethernet

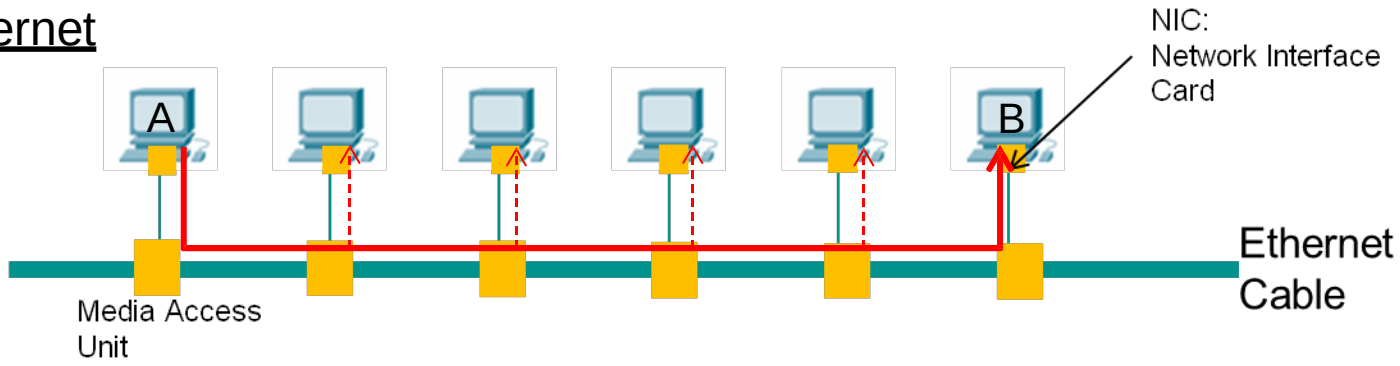
- Switched
- Full Duplex



Example: Ethernet Frame Sent from A to B

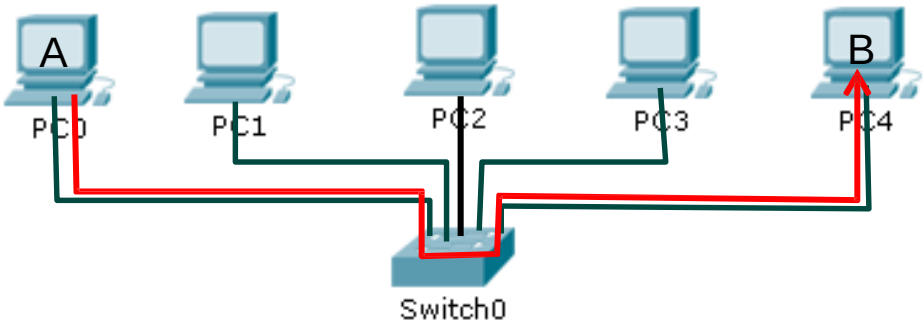
Legacy Ethernet

Source MAC: A
Dest MAC: B



Modern Ethernet

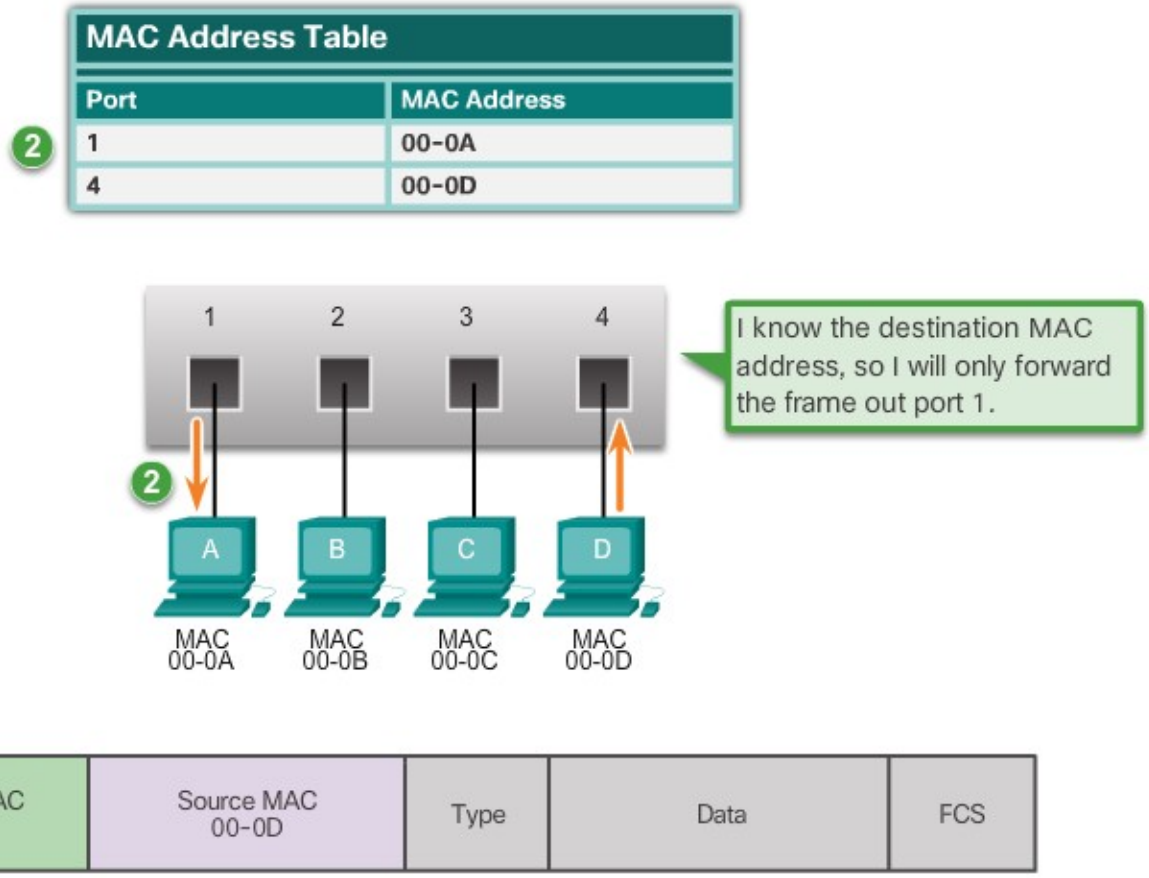
Source MAC: A
Dest MAC: B



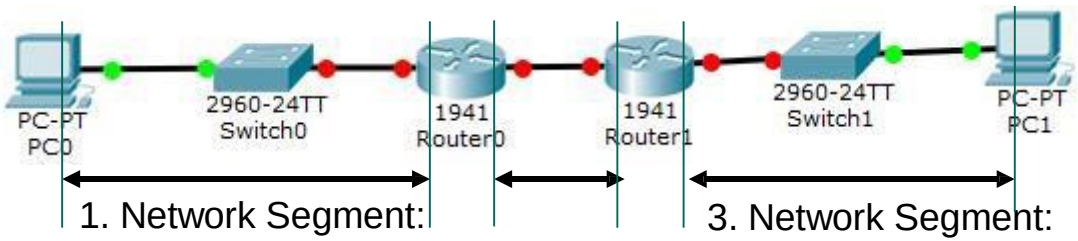
Layer 2 Switching - 4

Step 1: Forward the Frame

Since the Switch MAC Address table contains PC-A's MAC Address, it sends the frame out only port 1.



How Many Destination MAC Addresses

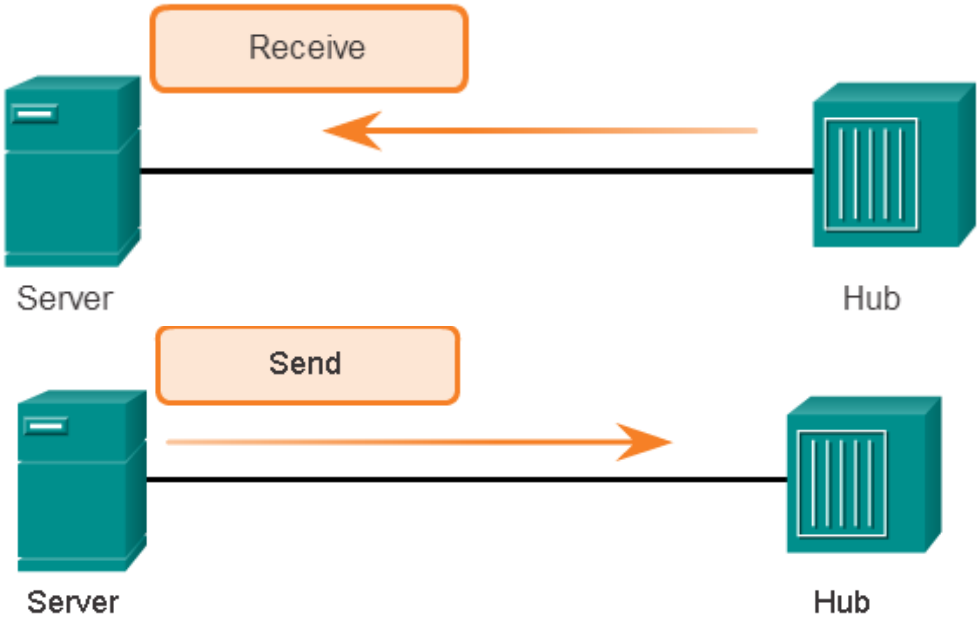


1. Network Segment: PC0 sends Frame to Router0

2. Router0 sends Frame to Router1

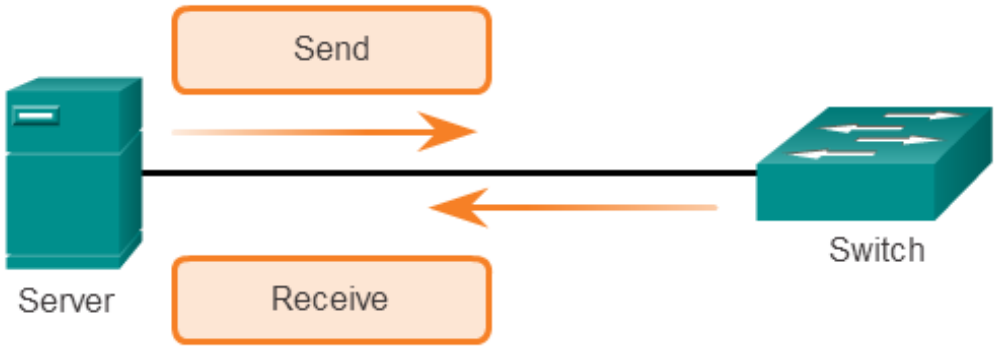
3. Network Segment: Router1 sends Frame to PC1

Half and Full Duplex



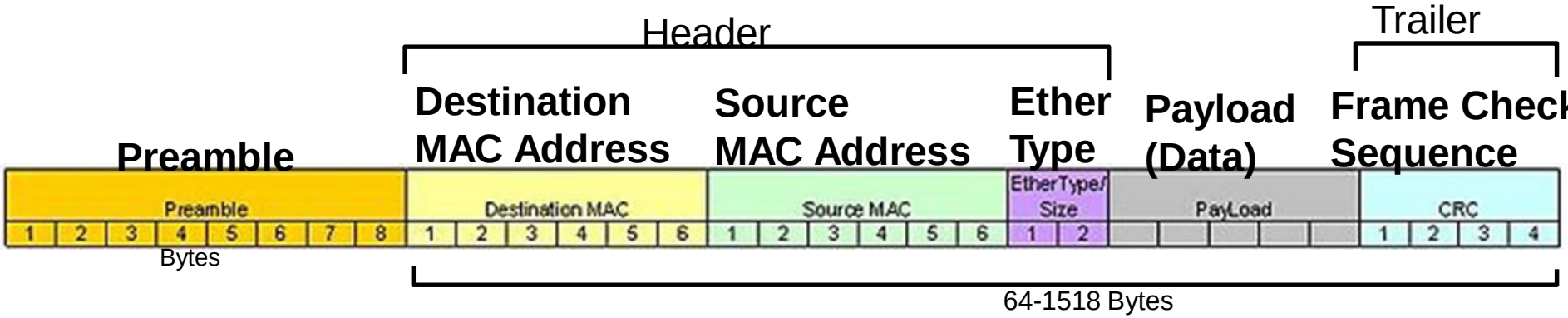
Half-Duplex Communication

Full-Duplex Communication



Ethernet Encapsulation

IEEE 802.3 Standard / Ethernet II



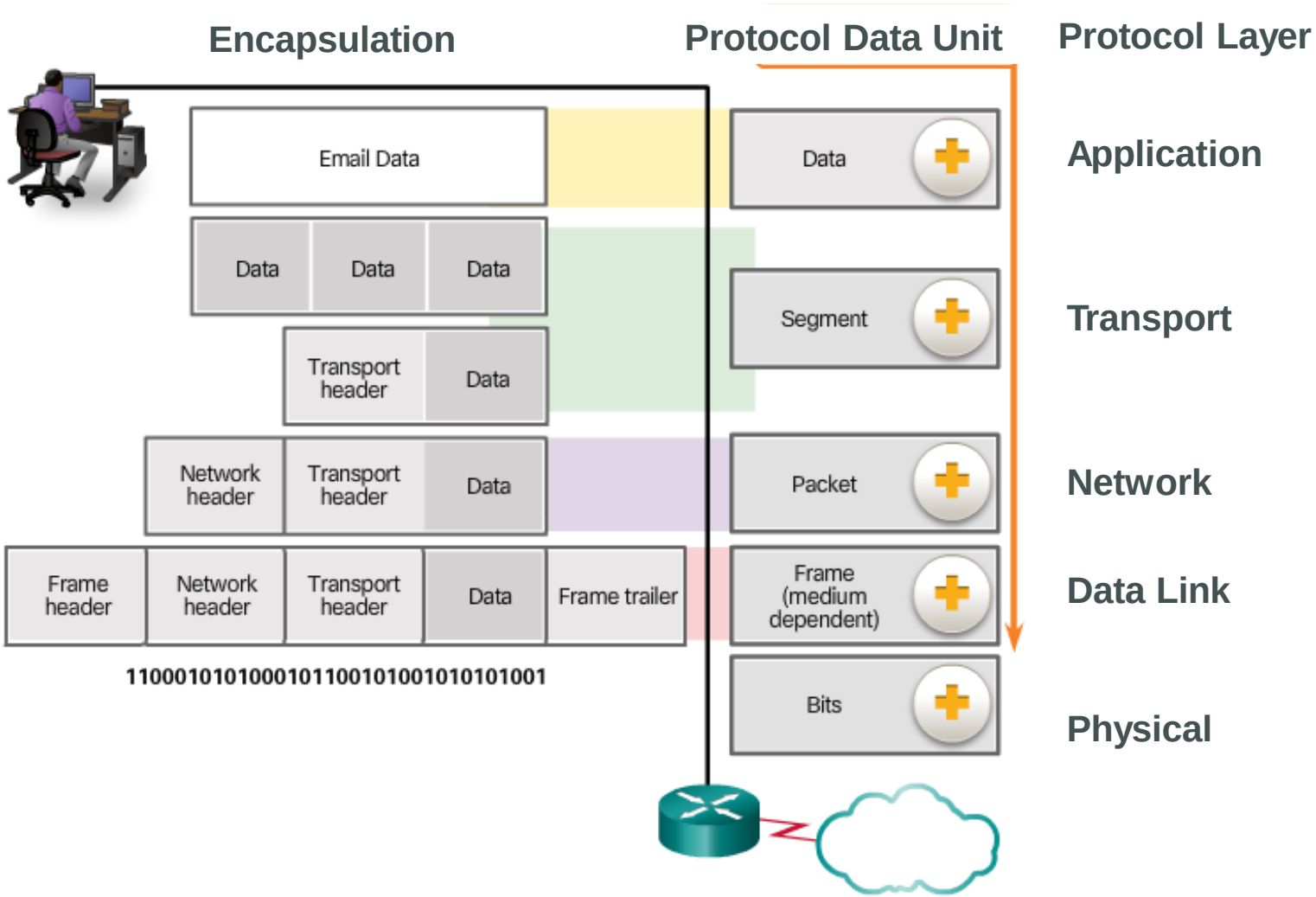
Preamble: sequence of 10101 for bit synchronization
Destination and Source MAC Address:
EtherType: Identifies upper layer Protocol, see table below for examples
Frame Check Sequence: Redundant information for error detection

EtherType for some notable protocols

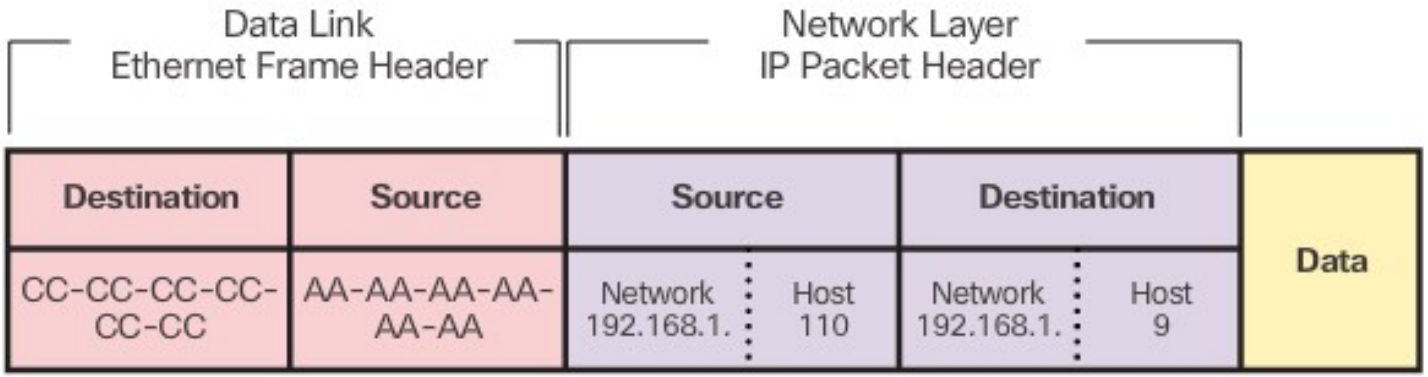
EtherType	Protocol
0x0800	Internet Protocol version 4 (IPv4)
0x0806	Address Resolution Protocol (ARP)
0x0842	Wake-on-LAN[6]
0x22F3	IETF TRILL Protocol
0x6003	DECnet Phase IV
0x8035	Reverse Address Resolution Protocol

Protocol Data Units

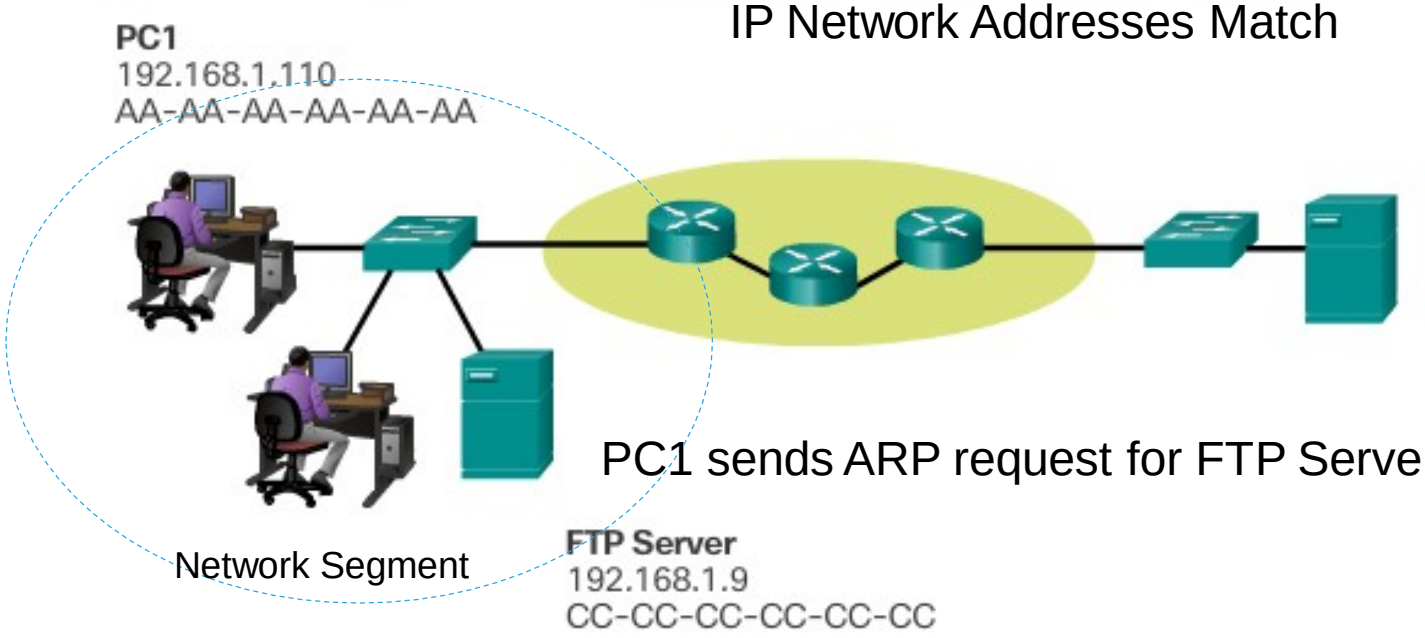
- **Segmentation – partition of application data into blocks of data**
- **A data block with its header is called a Protocol Data Unit (PDU)**



Devices on the Same Network

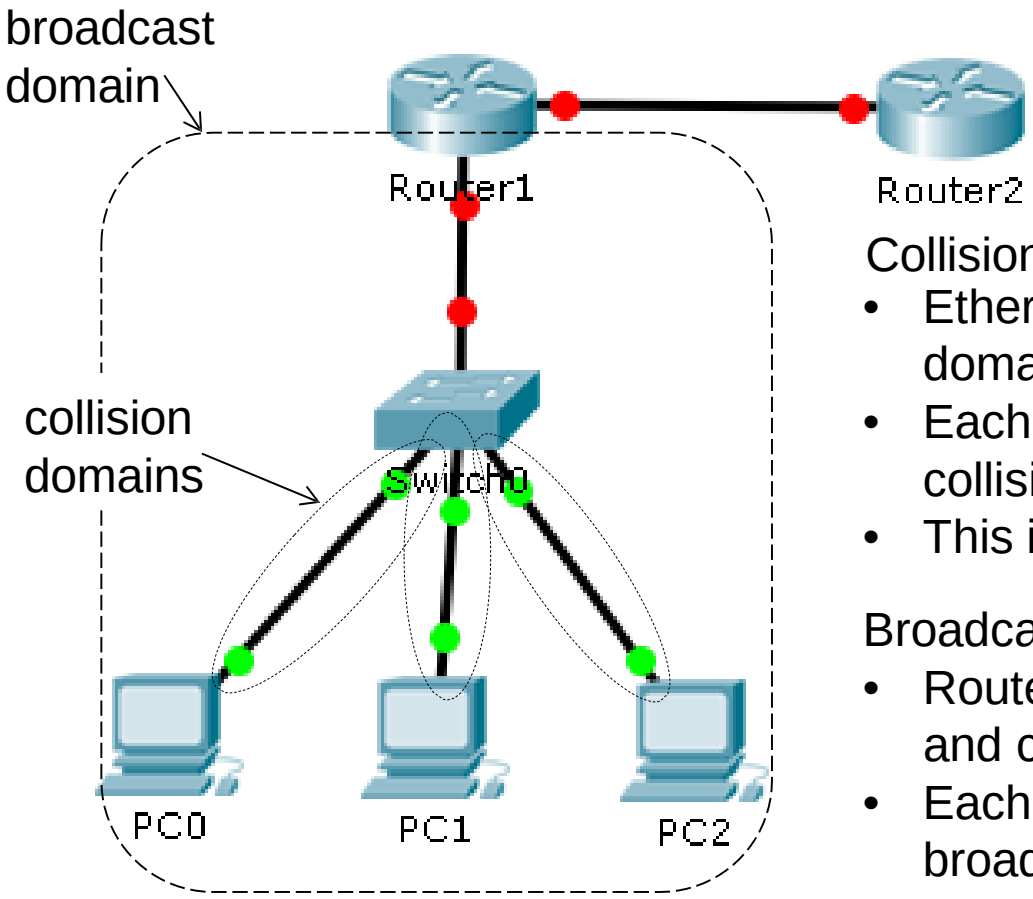


IP Network Addresses Match



PC1 sends ARP request for FTP Server

Collision Domain & Broadcast Domain: Ethernet Switched Network



Collision Domain:

- Ethernet Switches break up collision domains into point-to-point links.
- Each Switch port forms a separate collision domain
- This is due to the switching function

Broadcast Domain:

- Routers break up broadcast domains and collision domains
- Each Router port forms a separate broadcast domain
- Routers do not forward broadcasts
- The switch prevents collisions in the broadcast domain.

This is important for capacity planning