



Network Overview

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Cisco | Networking Academy®
Mind Wide Open™

Course Materials

- CCNA Routing and Switching
by Cisco Network Academy
 - Introduction to Networks
 - Routing and Switching Essentials
 - Scaling Networks
 - Connecting Networks
- <https://www.netacad.com/>
- CCNA : Cisco Certified Network Associate



Network Overview

Network devices

Network diagrams

Network connection

Network protocol

Introduction to Networks

Components of a Network

Types of Networks

Network Layers

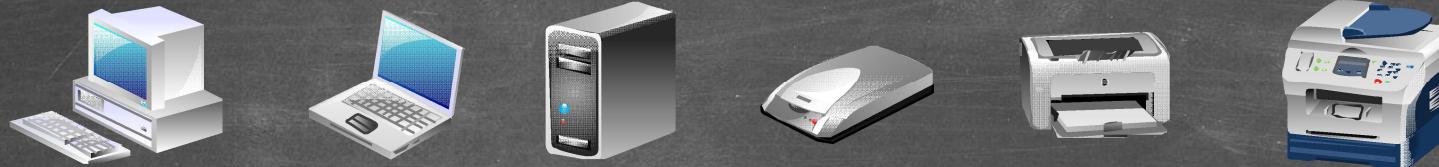
Accessing Local Resources

Intermediary network devices

Network Media

Network devices

- What are network devices?



- How are different of devices?



- How to connect devices?

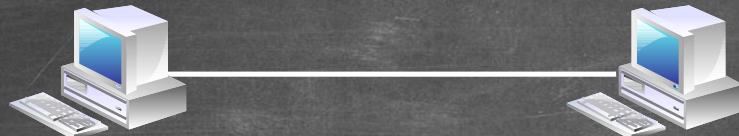


Network diagrams

- What is network diagram?
- What is the network topology?
- How are different of network diagram and network topology?
- Can you expand type of network diagram?

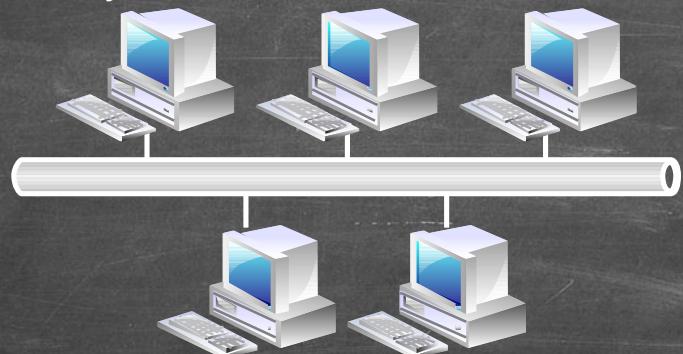
Network connection

- Two computer?



— A connect to B

- Many computer?

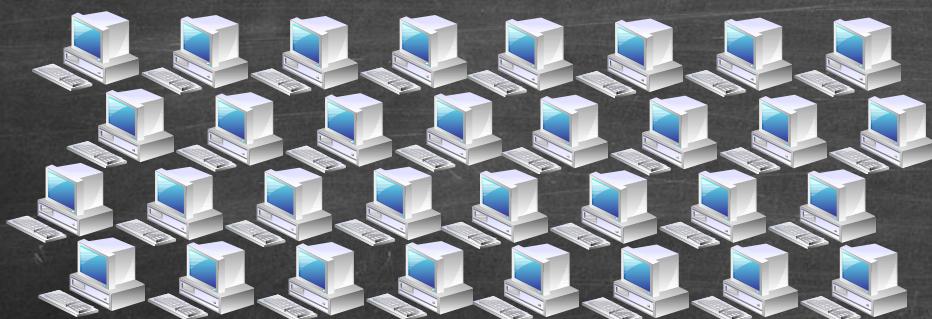


— A connect to B

— A connect to B and
C connect to D

— A connect to C and
B connect to C

- A lot of computers?

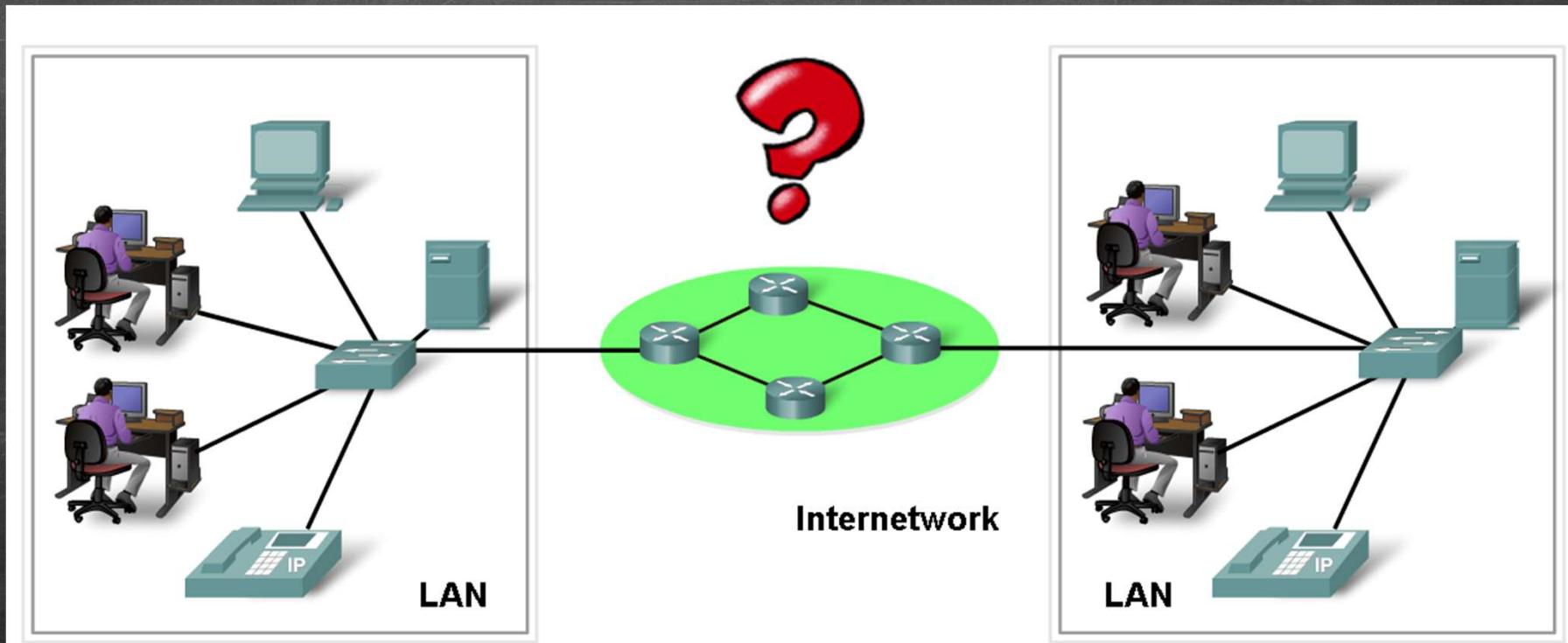


Network protocol

- What is protocol?
- What are network protocols?
- Why are network protocols important?
- What are network address?
- Why are network address important?

Components of a Network

- Network components
 - Hardware
 - Software

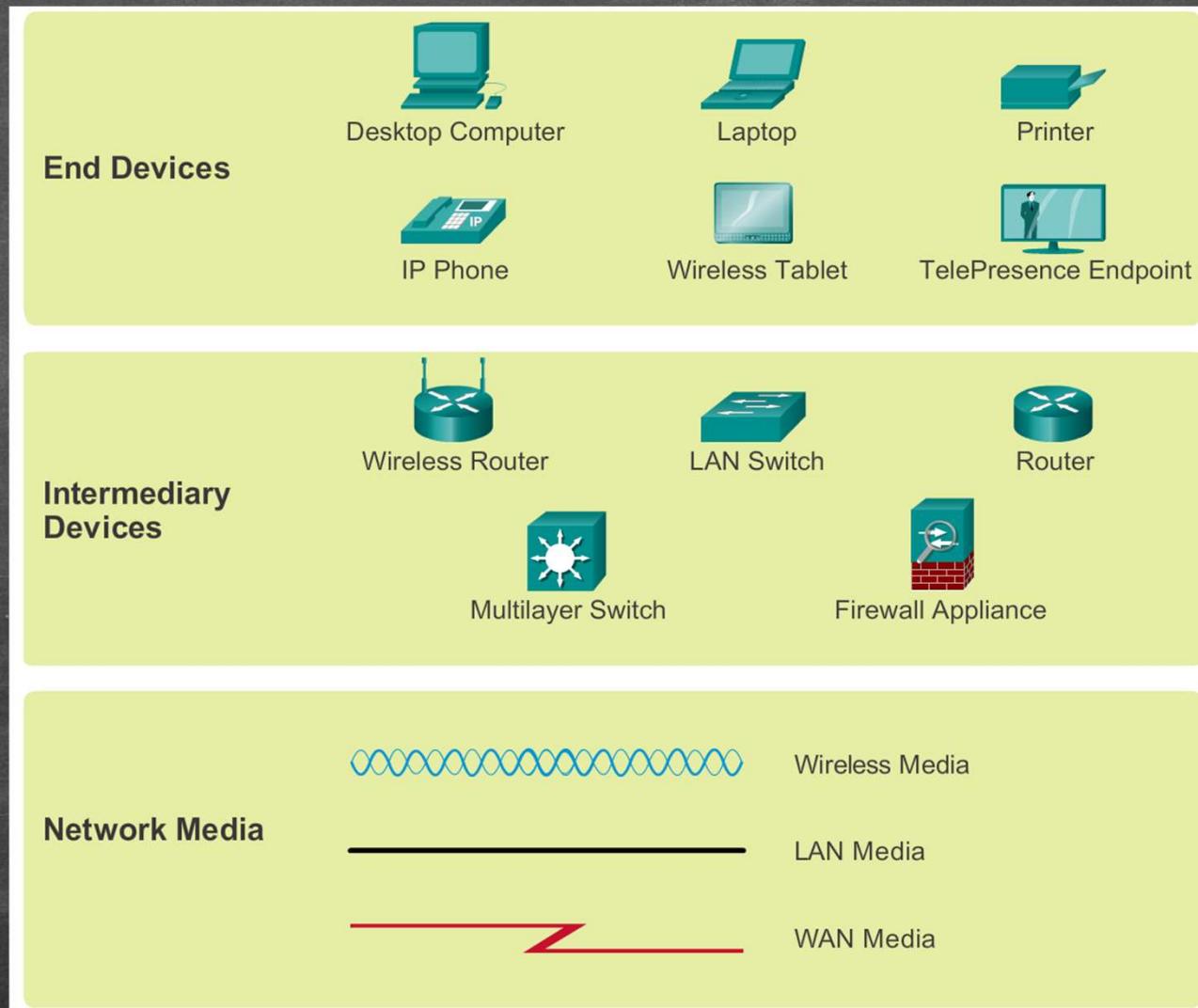


Components of a Network

- End Devices
- Intermediary network devices
 - Network Access Devices
 - Internetworking Devices
 - Security Devices
- Network Media
 - Copper
 - Fiber Optic
 - Wireless

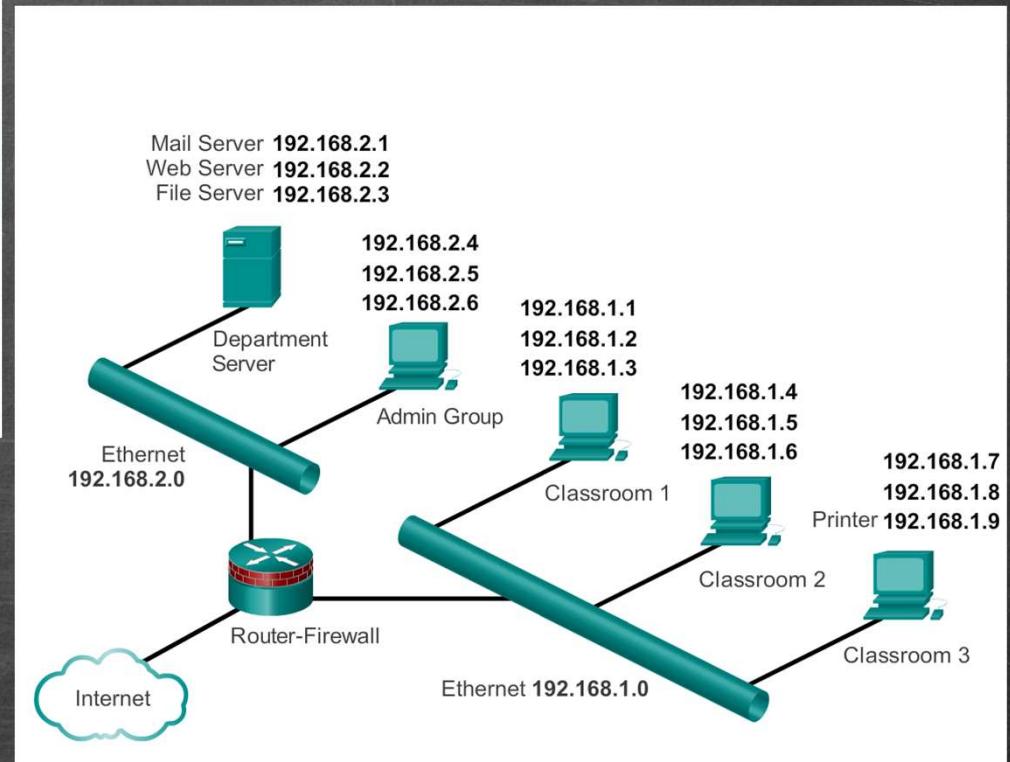
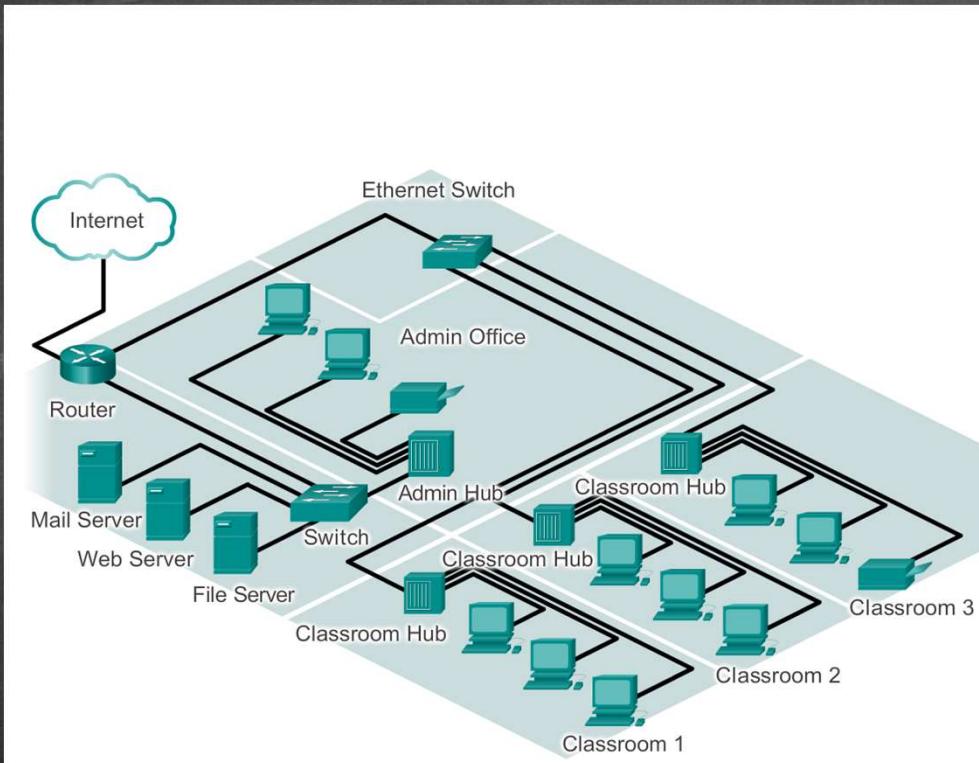
Components of a Network

- Network Representations



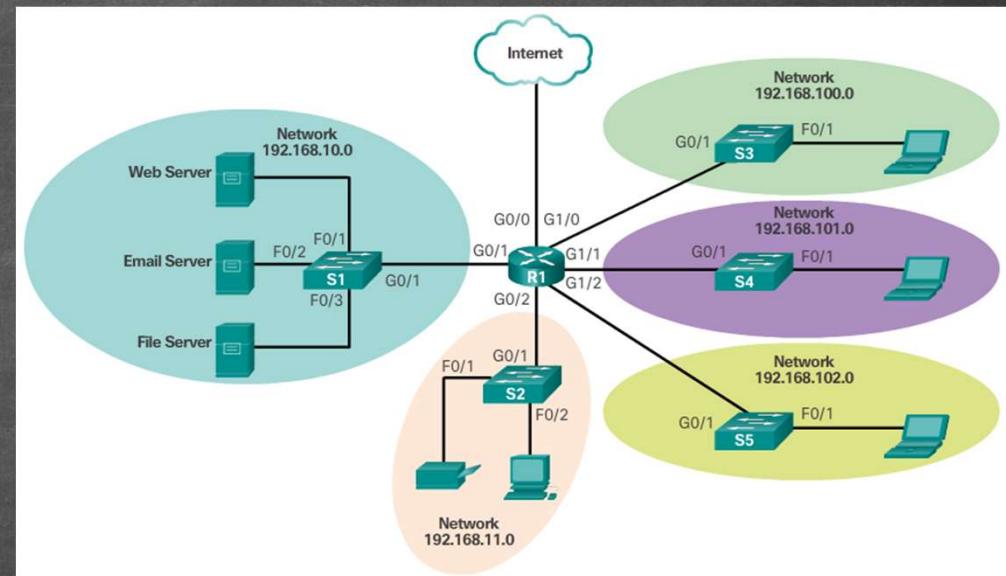
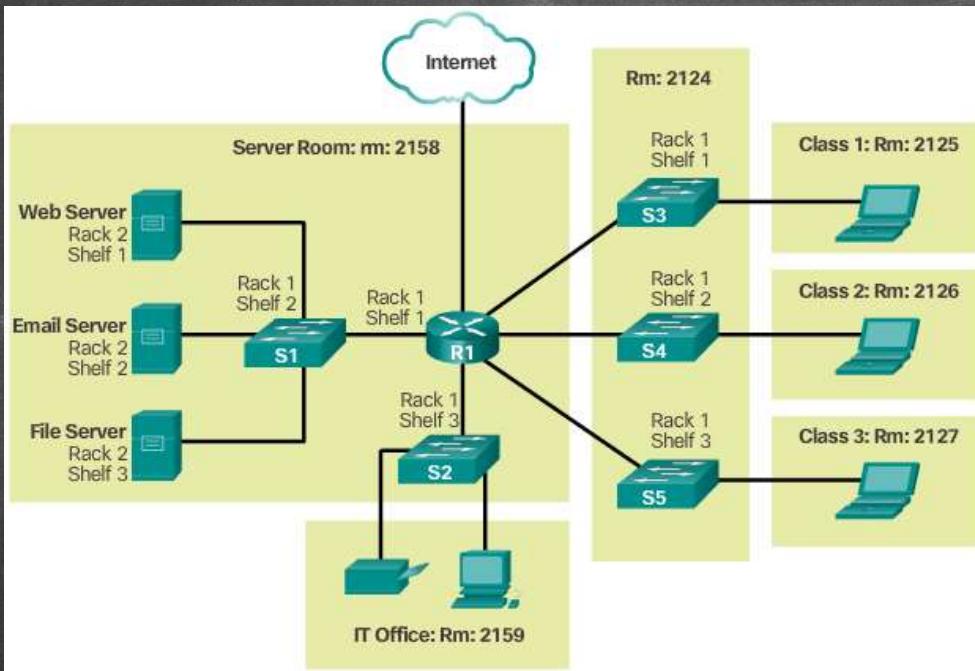
Components of a Network

- Topology Diagrams

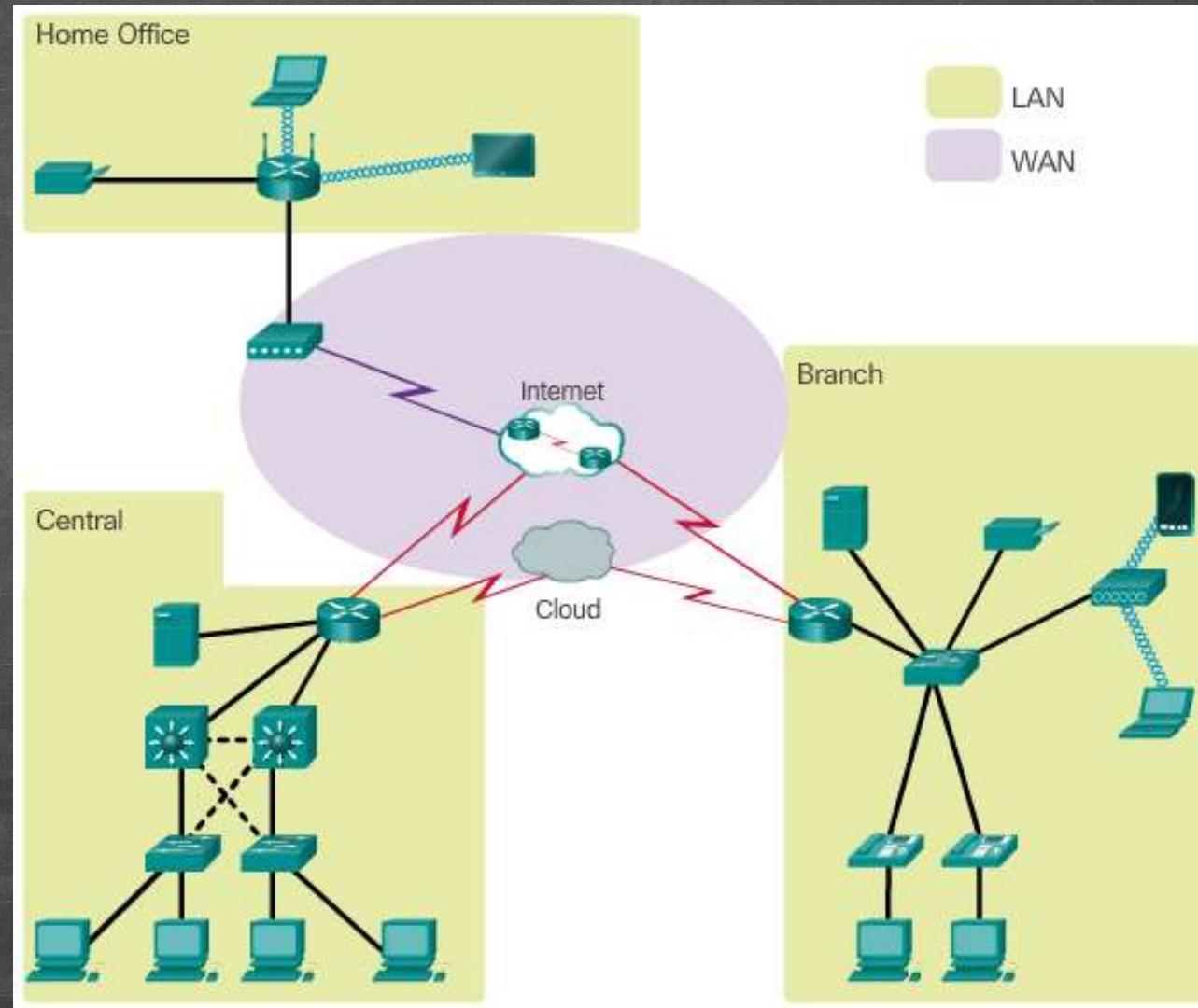


Components of a Network

- Topology Diagrams



Types of Networks

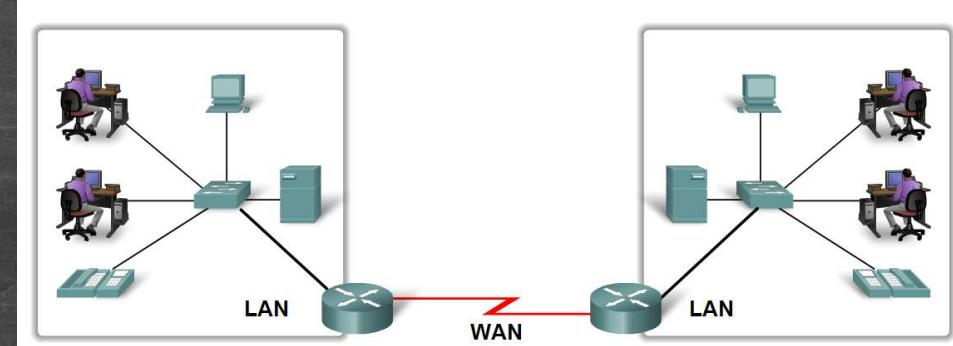
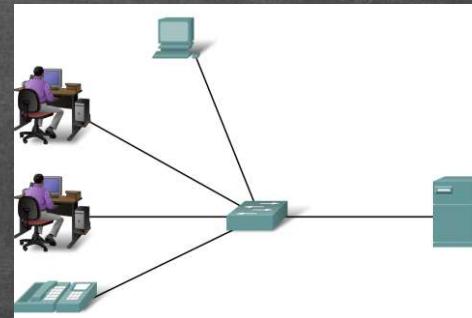


Types of Networks

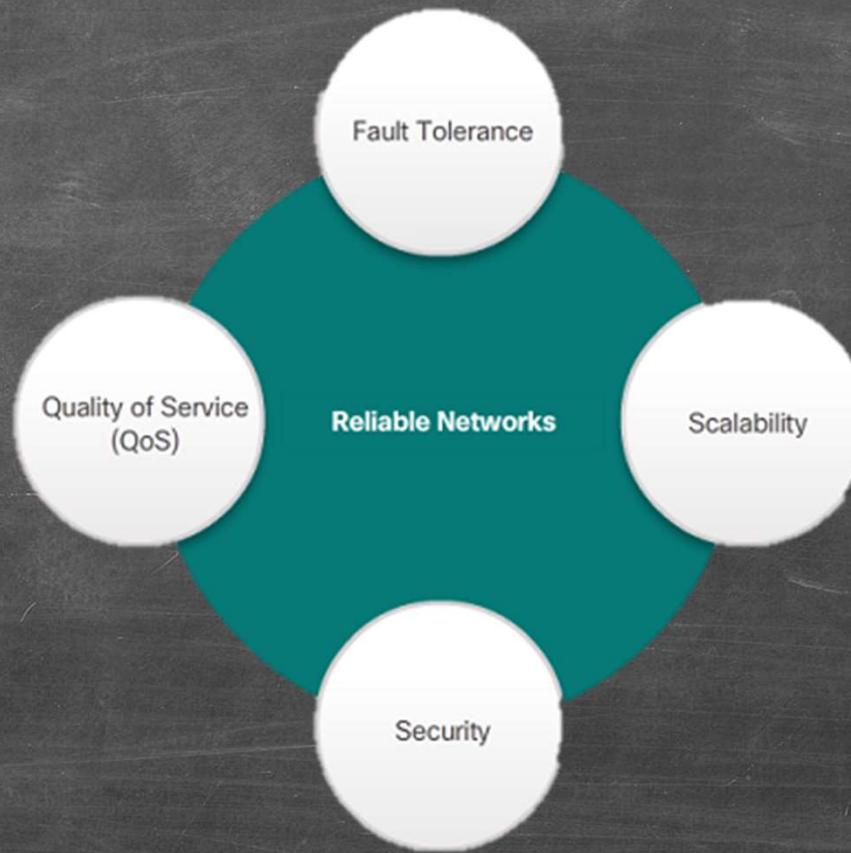
- Networks Sizes
 - Small Home Networks : connect a few computers to each other and the Internet
 - Small Office/Home Office : enables computer within a home or remote office to connect to a corporate network
 - Medium to Large Networks : many locations with hundreds or thousands of interconnected computers
 - World Wide Networks : connects hundreds of millions of computers world-wide - such as the Internet

Types of Networks

- The two most common types of network infrastructures are:
 - Local Area Network (LAN) : A network serving a home, building or campus is considered a Local Area Network (LAN)
 - Wide Area Network (WAN) : LANs separated by geographic distance are connected by a network known as a Wide Area Network (WAN)
- Other types of networks include:
 - Metropolitan Area Network (MAN)
 - Wireless LAN (WLAN)
 - Storage Area Network (SAN)
 - Personal Area Network (PAN)

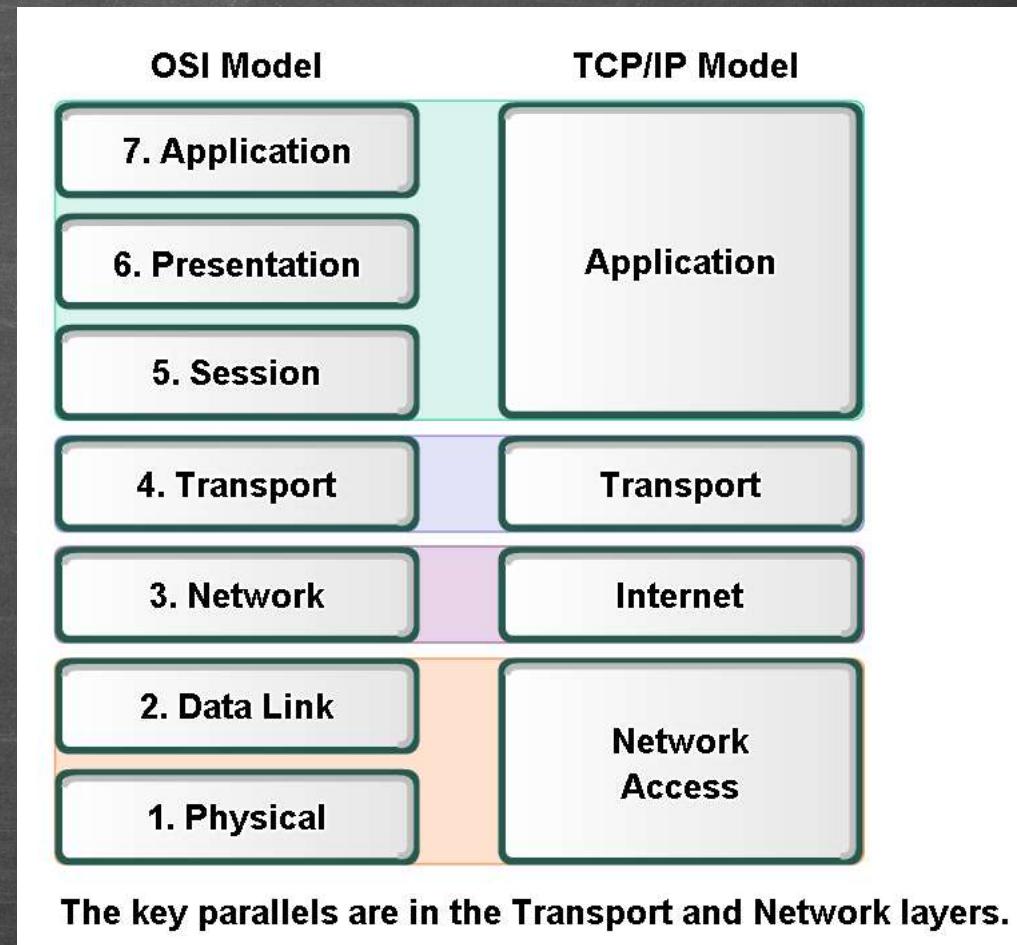


Reliable Network



Layers with TCP/IP and OSI Model

- Explain protocol and reference models
 - A protocol model
 - provides a model that closely matches the structure of a particular protocol suite.
 - A reference model
 - provides a common reference for maintaining consistency within all types of network protocols and services.



NETWORK COMMUNICATION PROTOCOLS

AppleTalk
Protocol Suite

Sun NFS
Protocol Suite

IBM
Protocol Suite

Media over IP
Protocol Suites

Mobile
Protocol Suites

TCP/IP
Protocol Suite

Microsoft
Protocol Suite

Novell Netware
Protocol Suite

X.25
Protocol Suite

ISO
Protocol Suite

Virtual Private Network
Protocol Suite

Other Supported
Protocol Suites

Application Layer

Name System

DNS

Host Config

BOOTP
DHCP

Email

SMTP
POP
IMAP

File Transfer

FTP
TFTP

Web

HTTP

Transport Layer

UDP

TCP

Internet Layer

IP

NAT

IP Support

ICMP

Routing Protocols

OSPF

EIGRP

Network Access Layer

ARP

PPP

Ethernet

Interface Drivers

When a single hour of network downtime can cost millions

... downtime is not an option

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subject to change without notice.

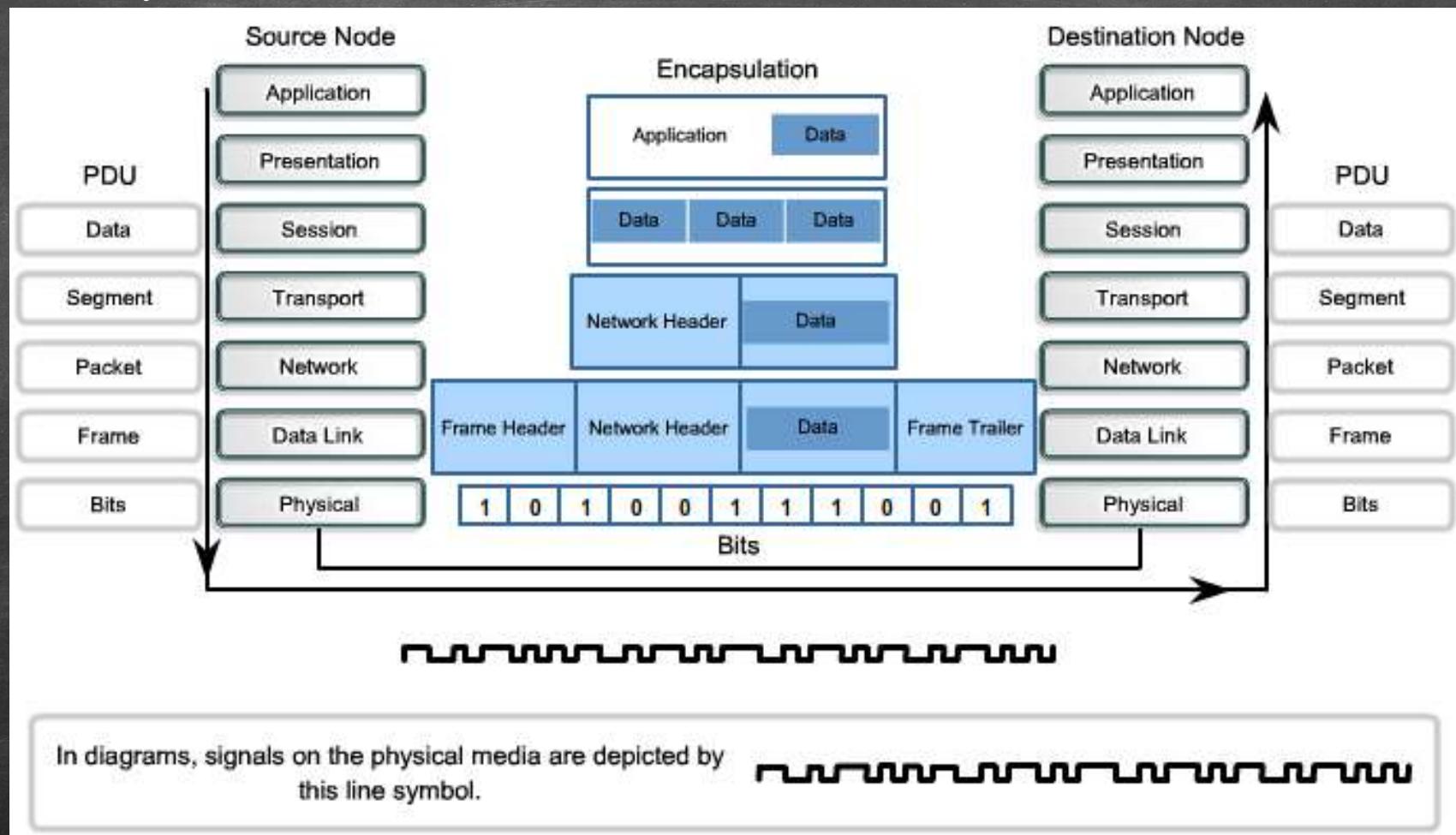
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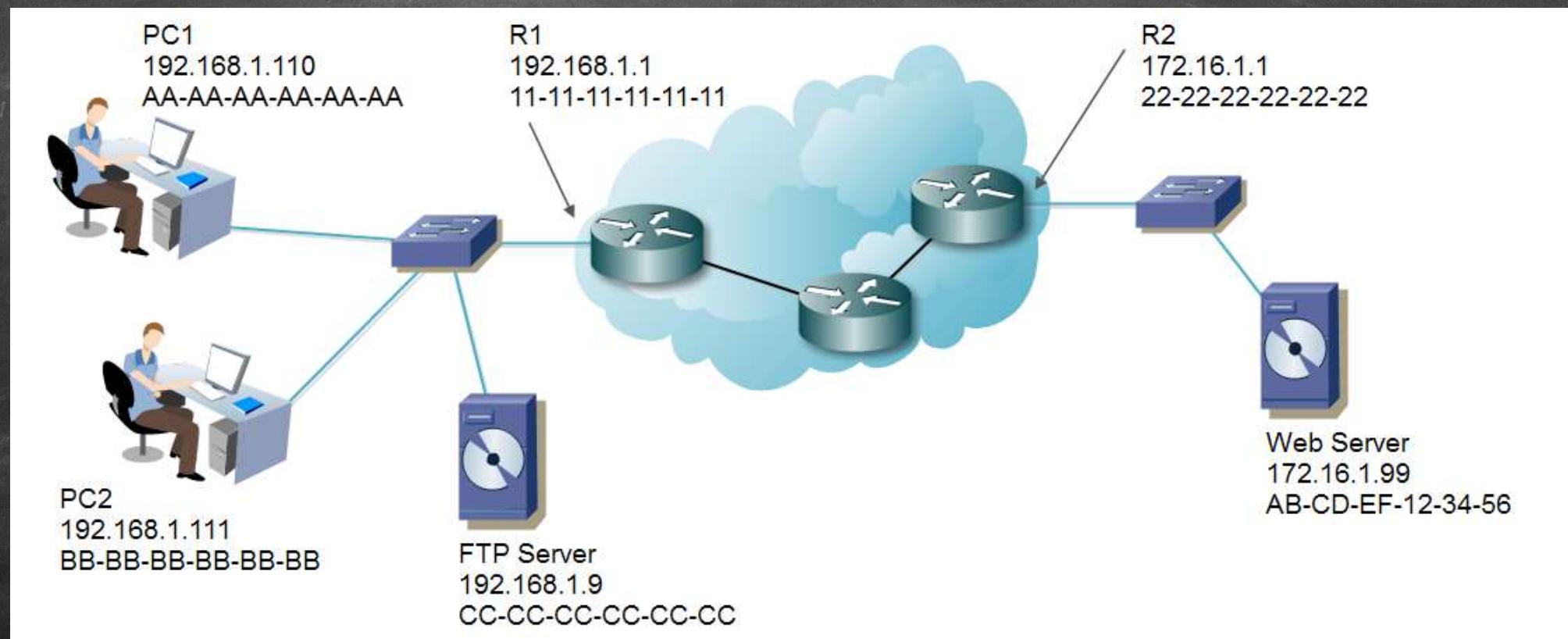
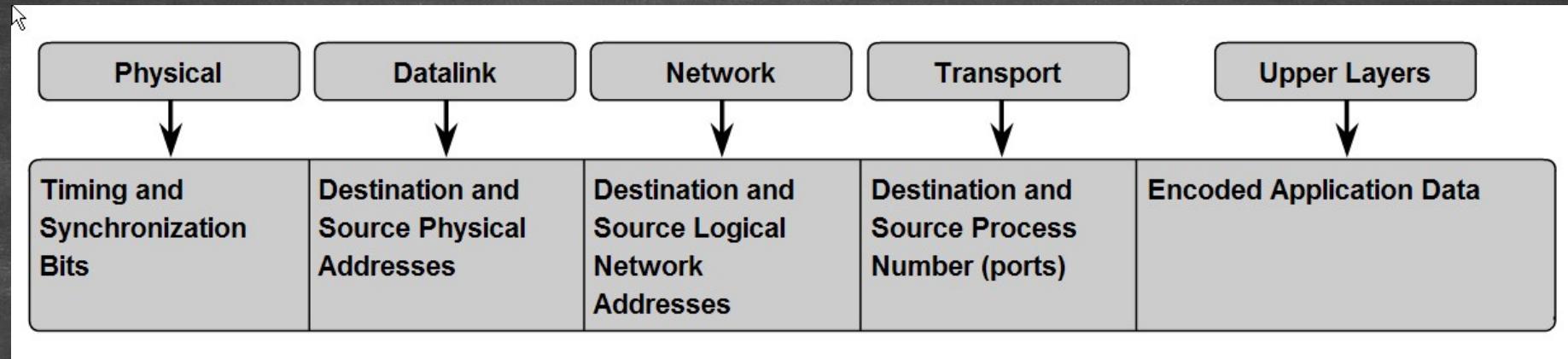


Layers with TCP/IP and OSI Model

- Explain protocol data units (PDU) and encapsulation



Accessing Local Resources



Accessing Local Resources

- PC1 => FTP Server

Accessing Local Resources

- PC1 => Web Server

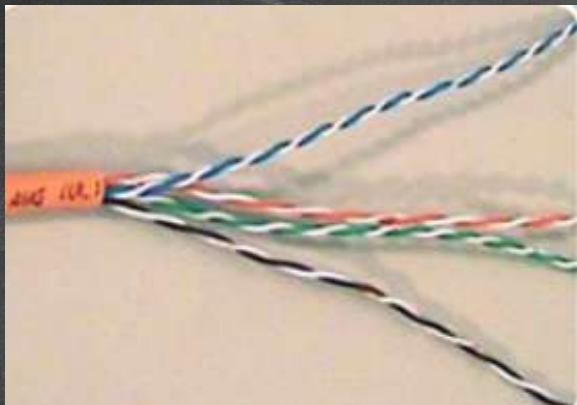
Accessing Local Resources

- PC1 => Web Server
- PC1 => FTP Server
- PC2 => FTP Server

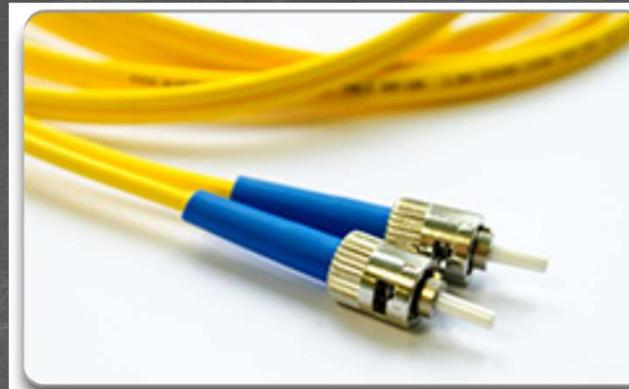
Intermediary network devices

- Hub, Repeaters
- Switches, Bridges
- Routers

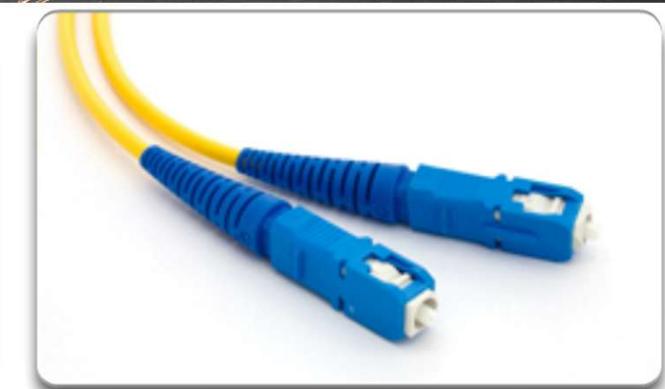
Network Media



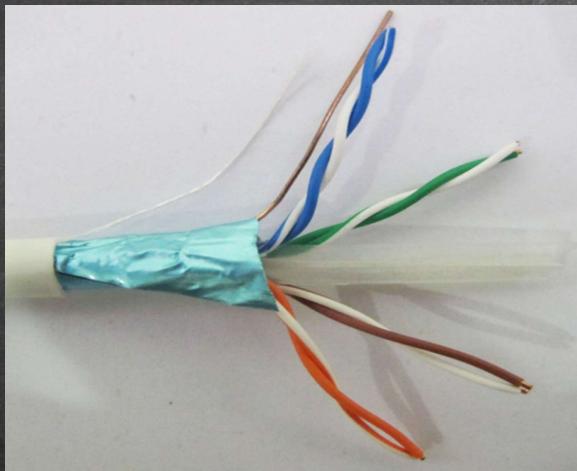
Unshielded Twisted Pair (UTP) cable



ST Connectors



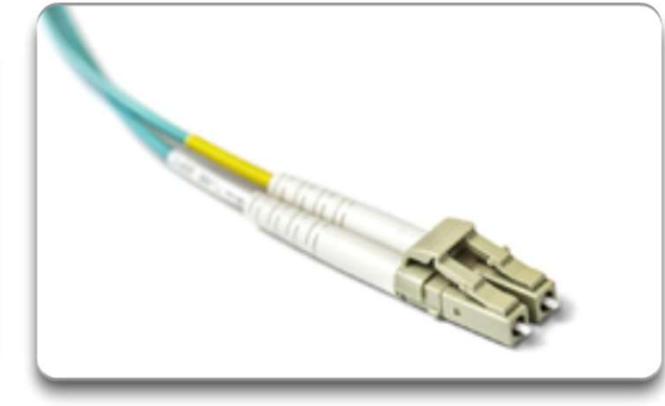
SC Connectors



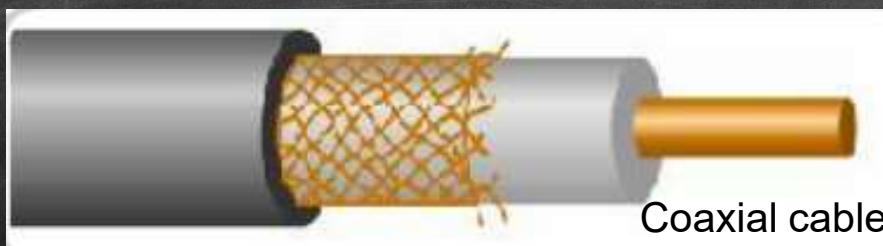
Shielded Twisted Pair (STP) cable



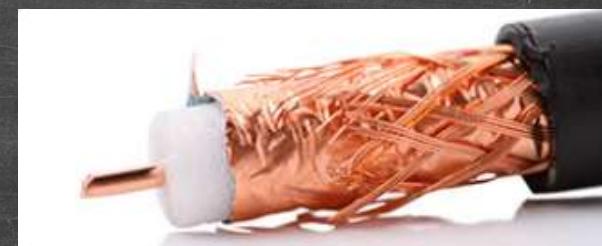
LC Connector



Duplex Multimode LC Connectors

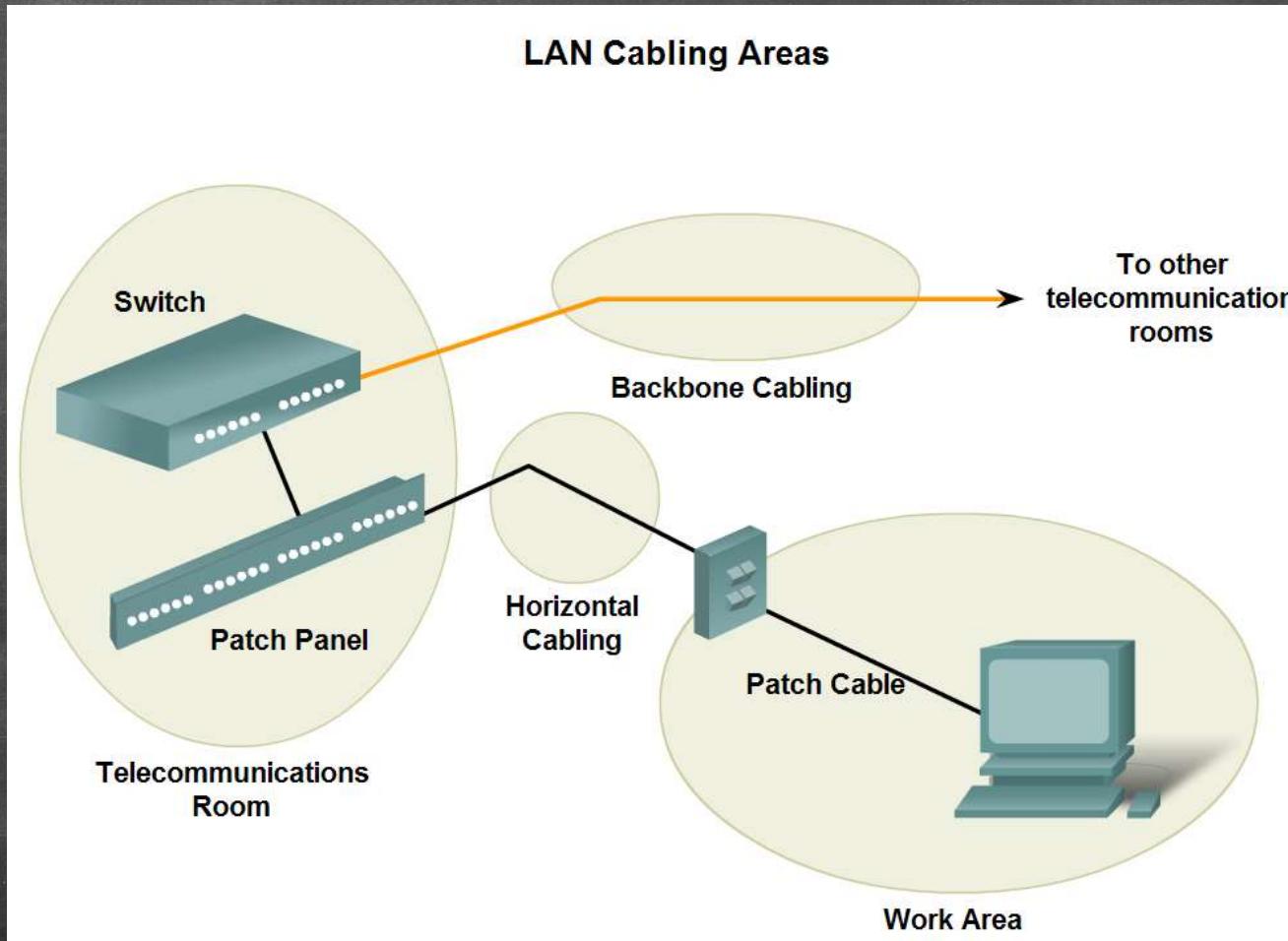


Coaxial cable



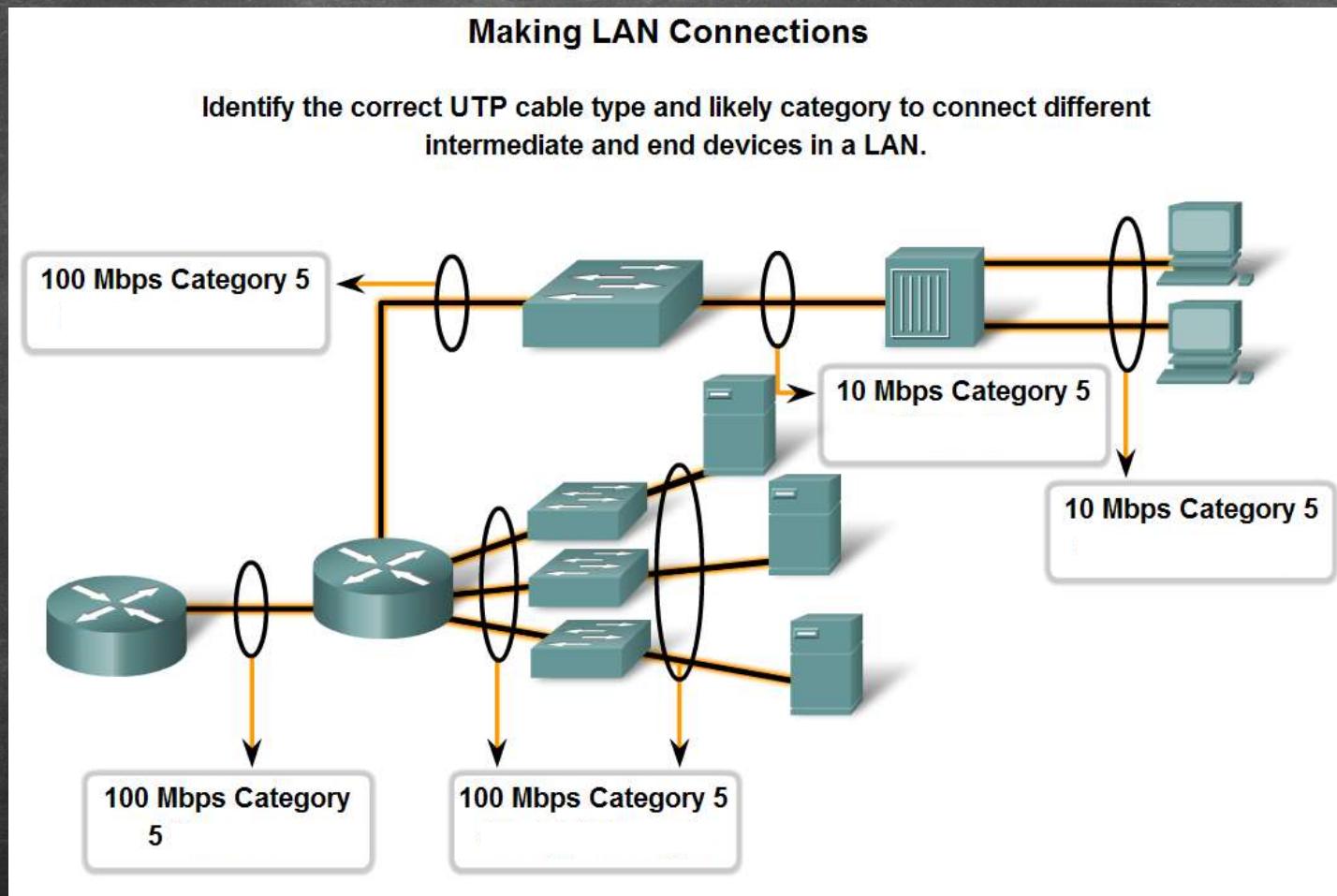
Types of Connections in a LAN

- Given a specific network connection, identify the type of cable required to make the connection



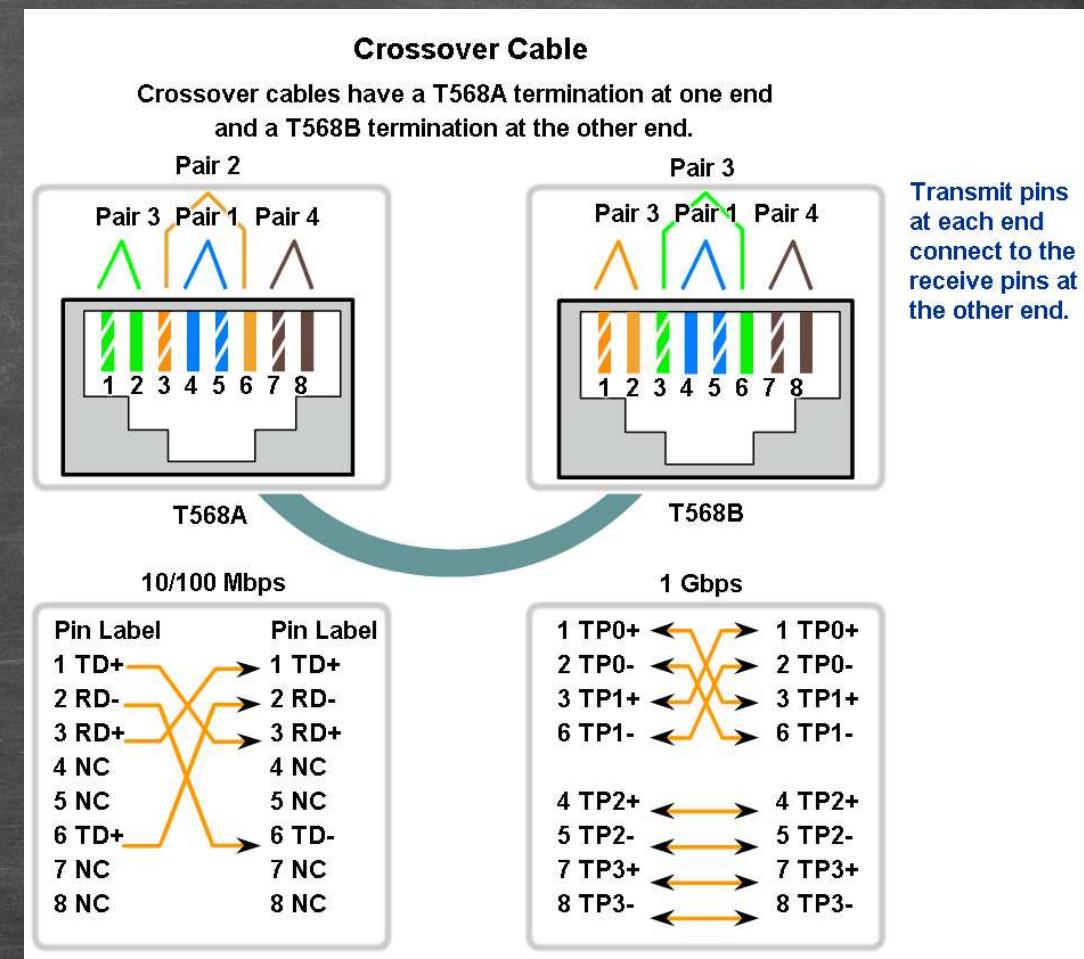
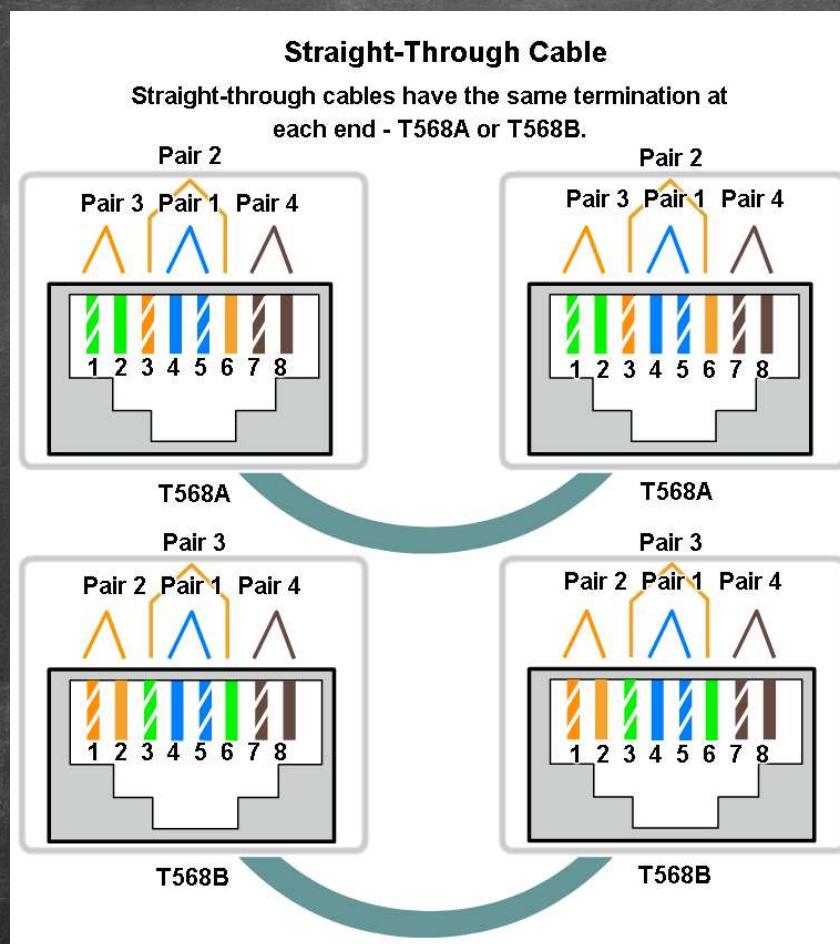
Types of Connections in a LAN

- Identify the correct cable to use in connecting intermediate and end devices in a LAN.



Types of Connections in a LAN

- Identify the pinout of the straight-through and cross-over cables



RJ-45 T568A & T568B Termination

Pair 2

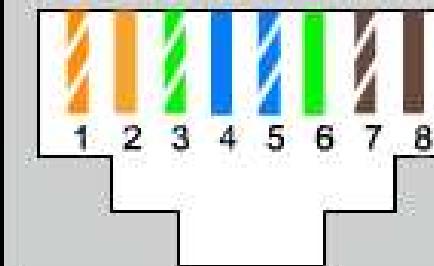
Pair 3 Pair 1 Pair 4



T568A

Pair 3

Pair 2 Pair 1 Pair 4



T568B



T568A
(Top View)



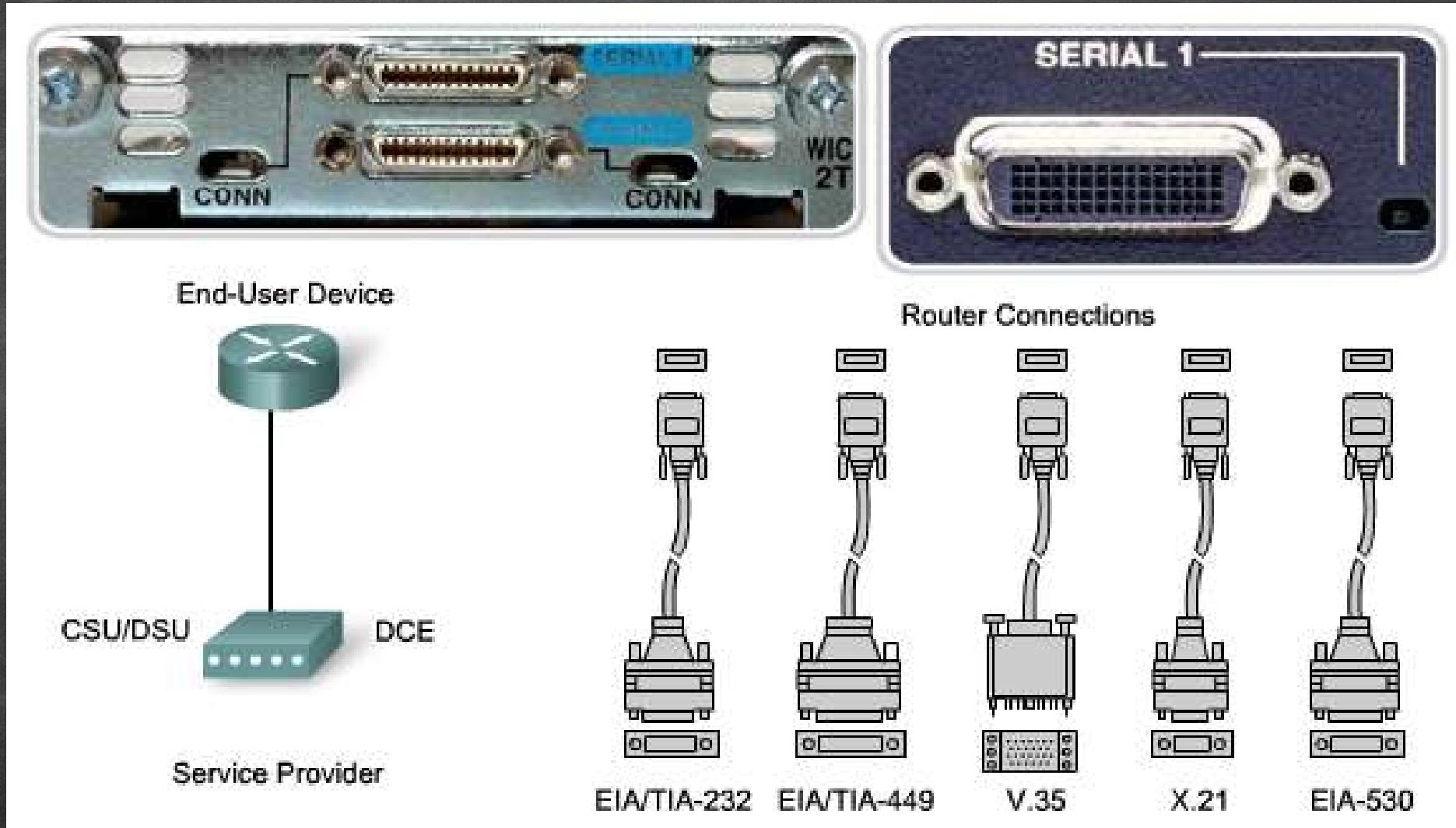
T568B
(Top View)

Types of Connections in a LAN

- Recognize that a different class of cables is used to connect WANs, and that the cables, standards and ports are different than those in use by LANs.

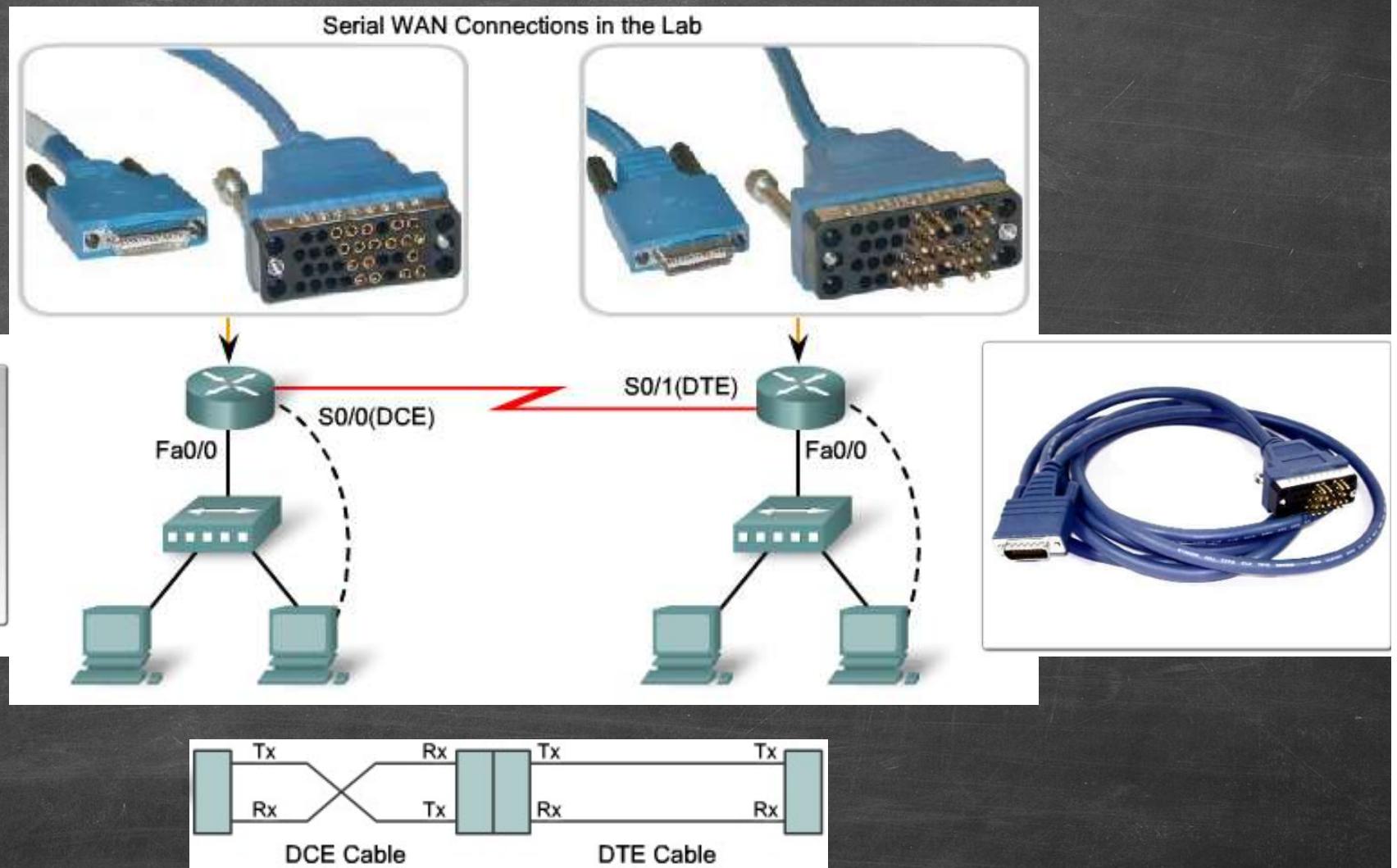
Types of WAN Connections						
Cisco HDLC	PPP	Frame Relay	DSL Modem	Cable Modem		
EIA/TIA-232 EIA/TIA-449 X.21V.24 V.35 High Speed Serial Interface (HSSI)	RJ-11 Note: Works over telephone line		F Note: Works over Cable TV line			
						
Router: Male Smart Serial			Network: Male Winchester Block Type			

Types of Connections in a LAN



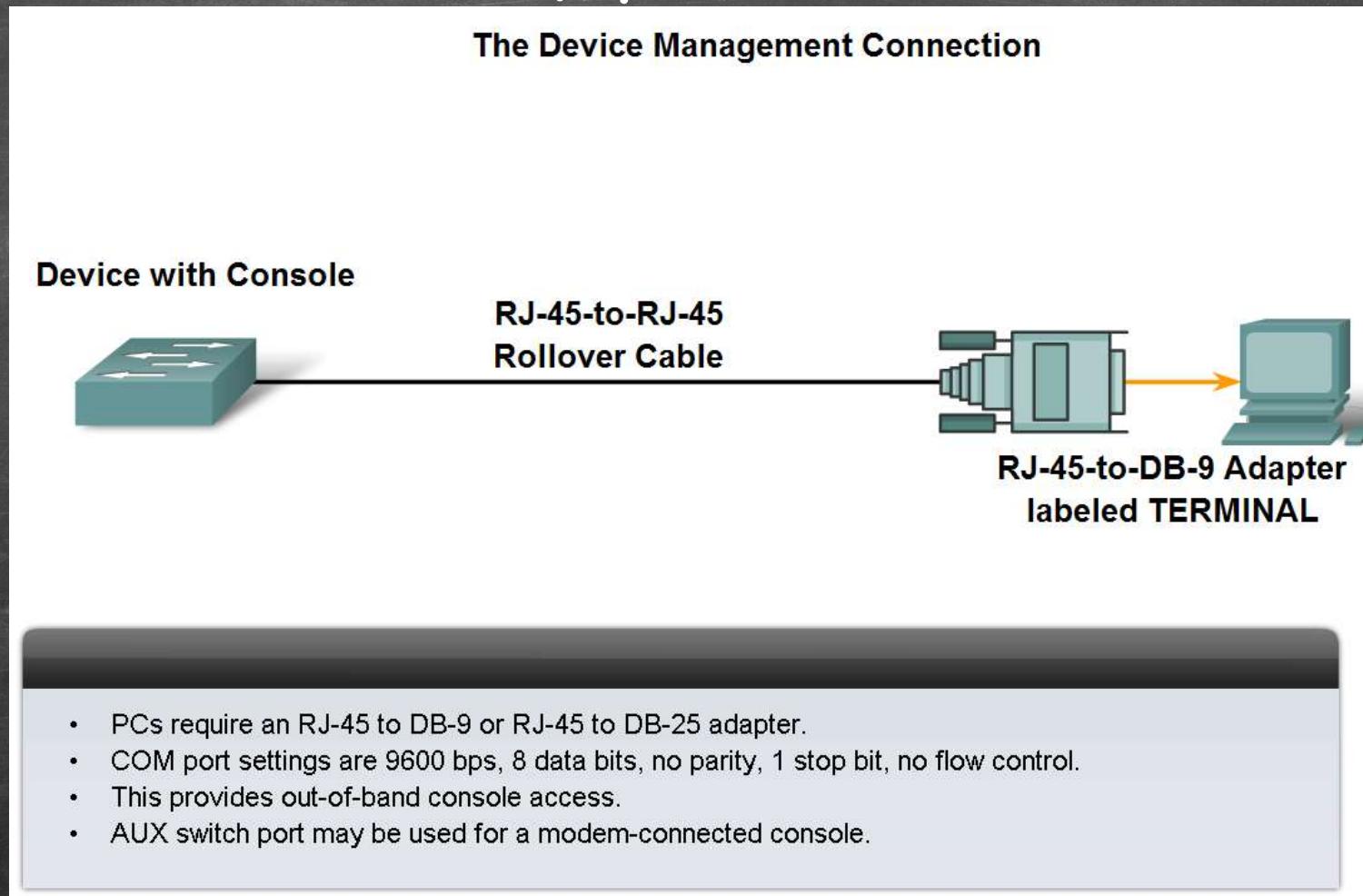
Types of Connections in a LAN

- Making WAN Connections



Types of Connections in a LAN

- Define the role of device management connections when using Cisco equipment.



Questions and Answers

