



# 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

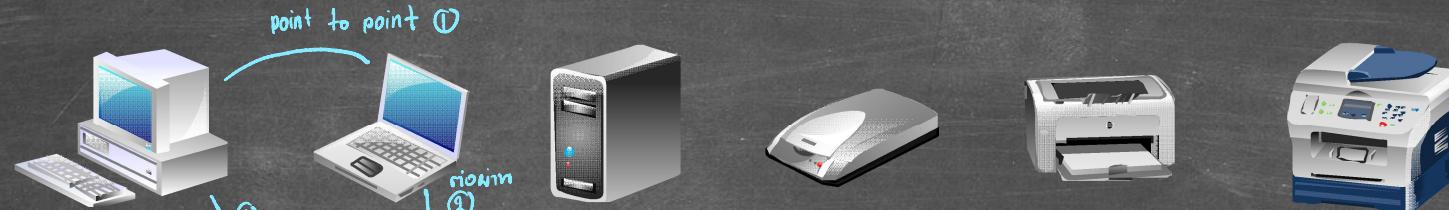
Intermediary network devices

Network Media

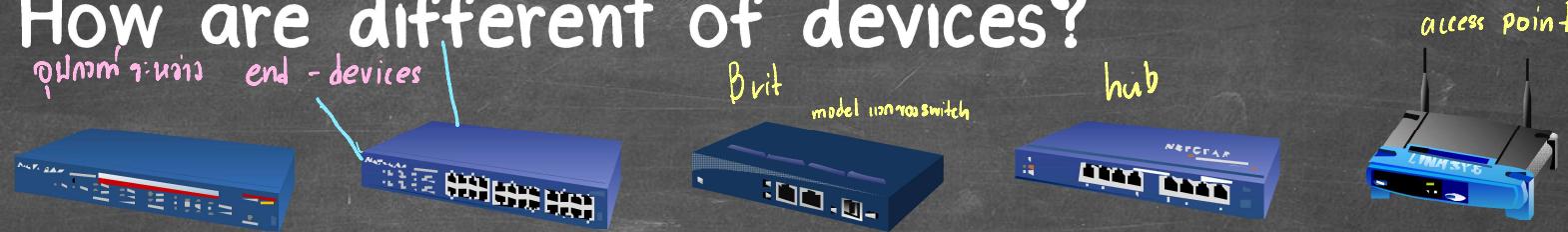
# Network devices

ឧបសម្រាប់ (devices) ទាំងអស់

- ① • What are network devices?



- ② • How are different of devices?



- ③ • How to connect devices?



# Network diagrams

- What is network diagram?

รูปแบบทางเชื่อมต่อของทุกๆ เครื่องในเครือข่าย

(จริง) ↑  
(เด็ก)

ผู้สอน

ผู้สอน

- What is the network topology?

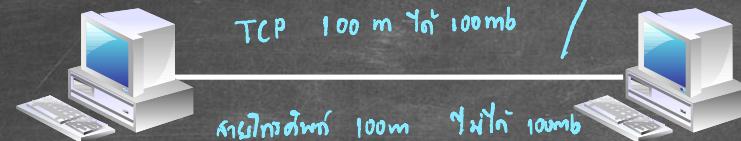
- How are different of network diagram and network topology?

logical diagram  
จริง physical diagram → device + connection

- Can you expand type of network diagram?

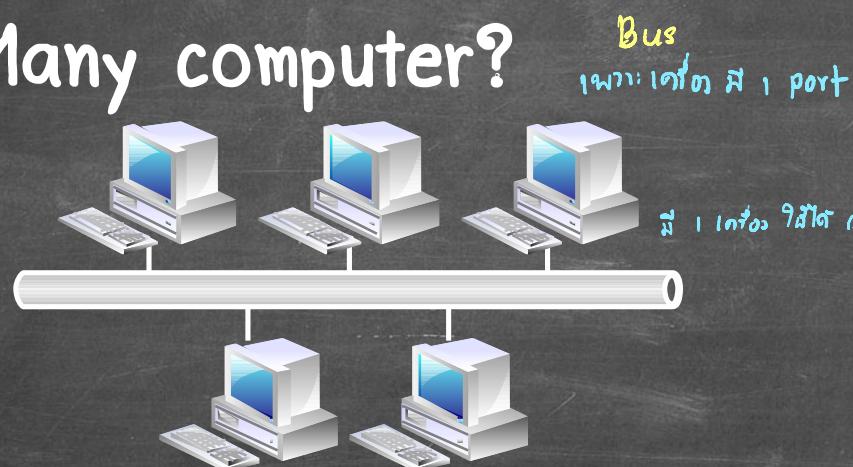
# Network connection

- Two computer?



-A connect to B

- Many computer?

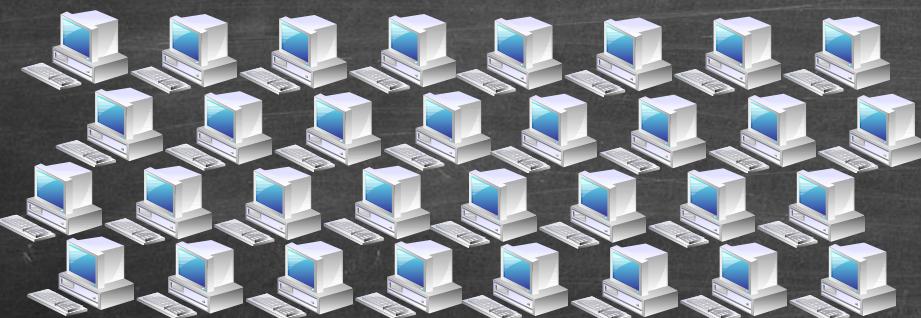


-A connect to B

-A connect to B and  
C connect to D

-A connect to C and  
B connect to C

- A lot of computers?

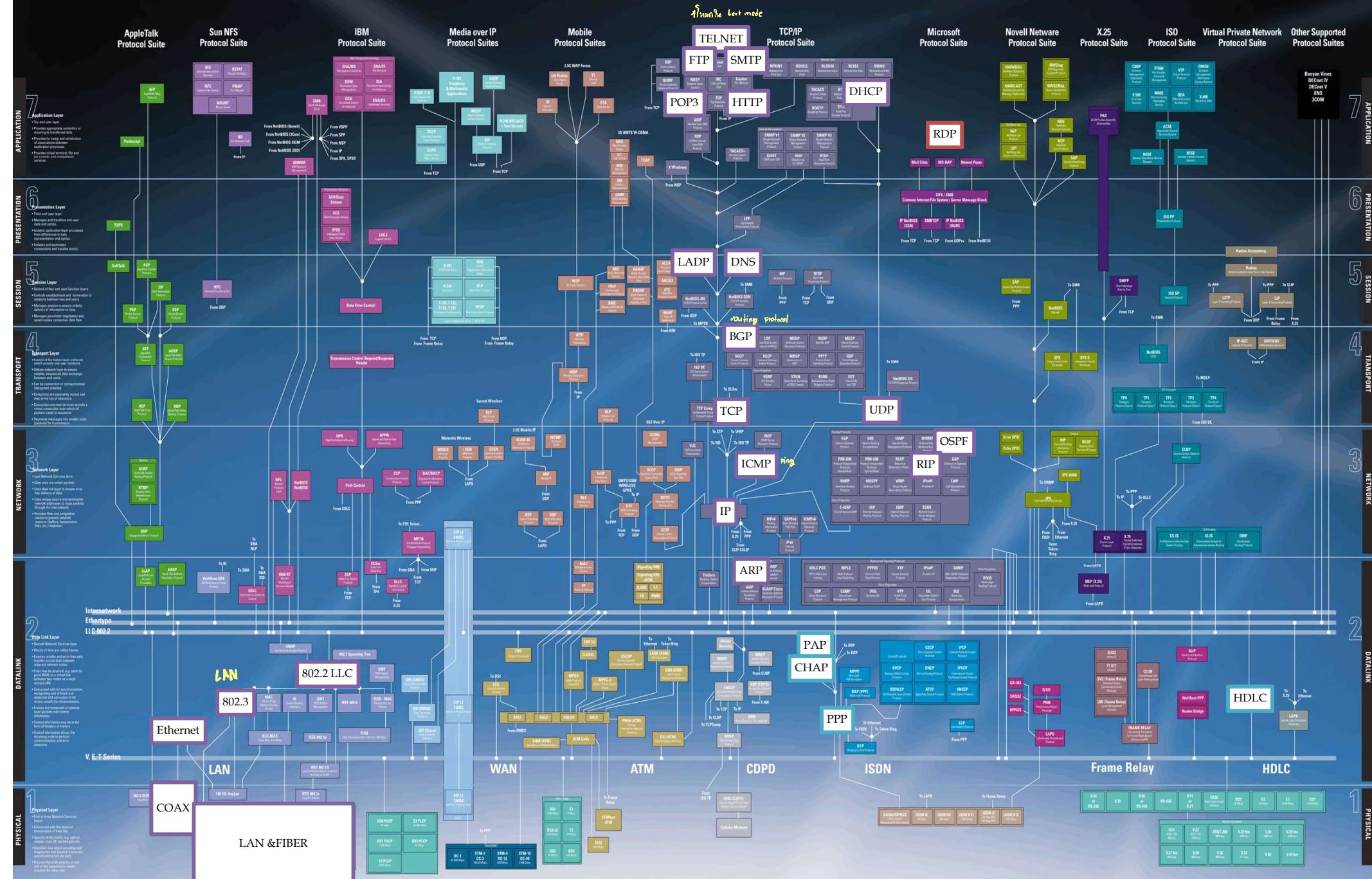


# Network protocol

- What is protocol?
  - იუნიკ ფორმა
  - Devices შე ეძღვის protocol უქმნა No break down ჩავა
- What are network protocols?
- Why are network protocols important?

- What are network address?
  - IP addr, mac addr
- Why are network address important?
  - mac addr უნიკ იდენტიფიკაცია
  - IP addr
  - port

## NETWORK COMMUNICATION PROTOCOLS



**When a single hour of network downtime can cost millions**

*... downtime is not an option*

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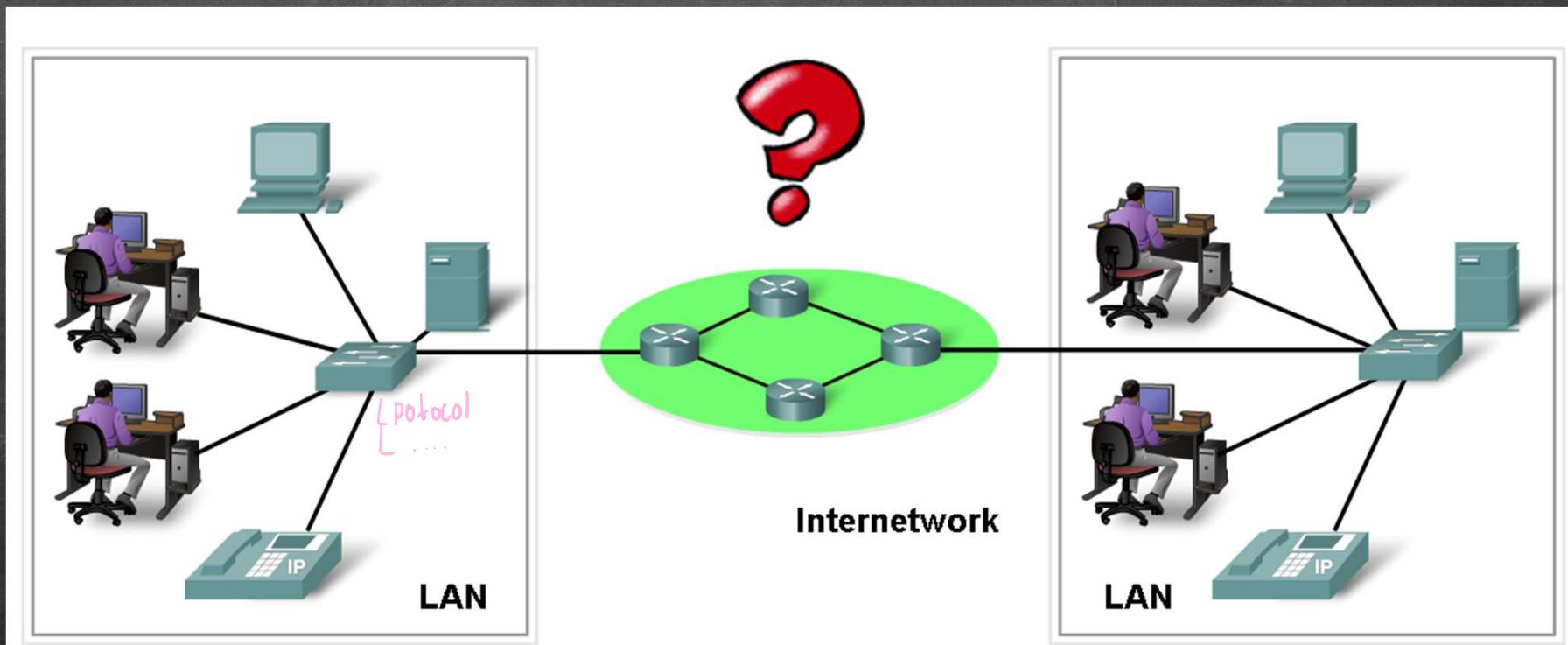
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Email: [tm\\_asia@agilent.com](mailto:tm_asia@agilent.com)

# Components of a Network

- Network components

- Hardware เครื่อง สາຍ LAN , router

- Software ឧបករណ៍ និងមុខងារ ដូចជា សេវាទឹក ផ្លូវការ និងសំគាល់ស្ថាប់

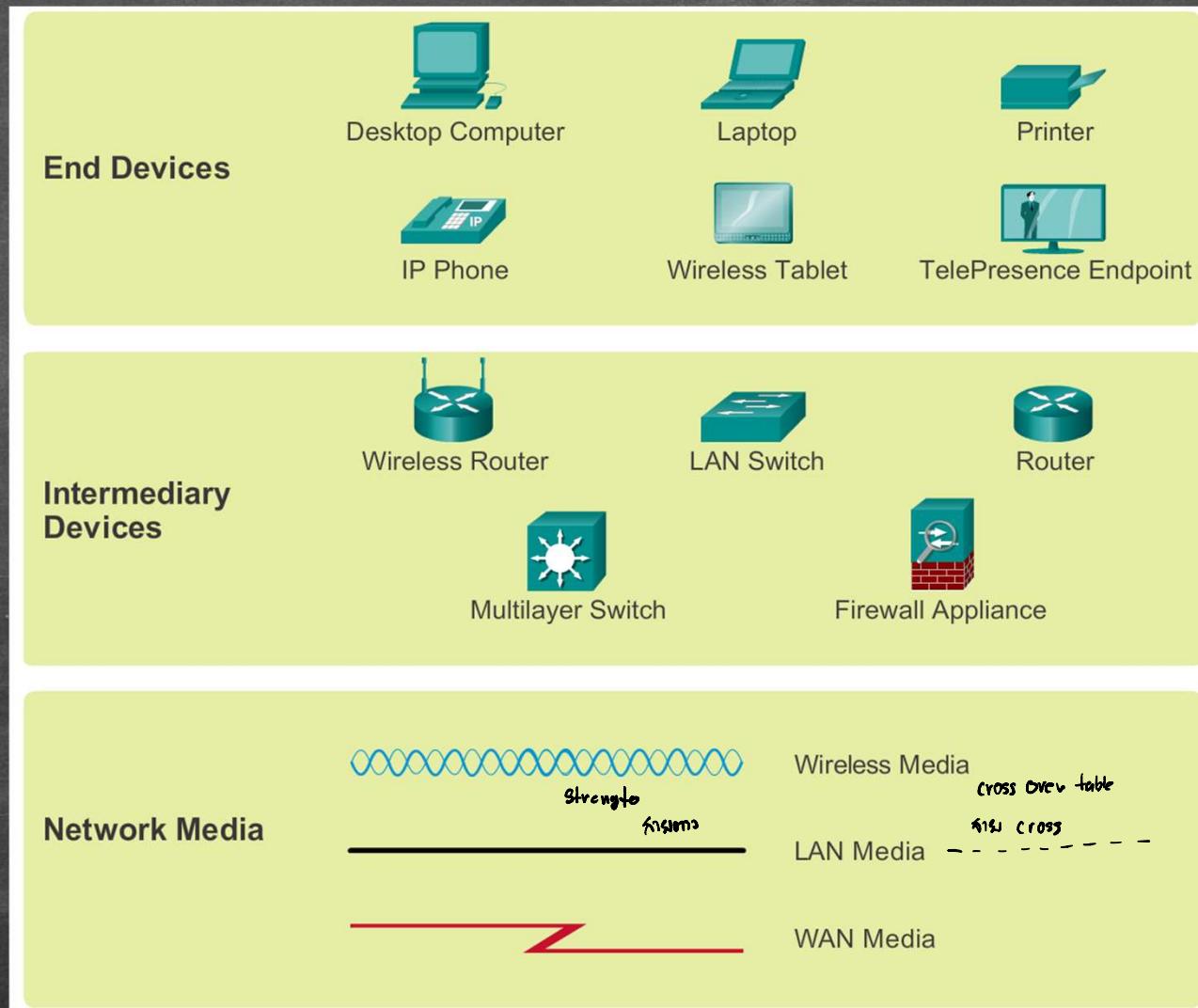


# Components of a Network

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

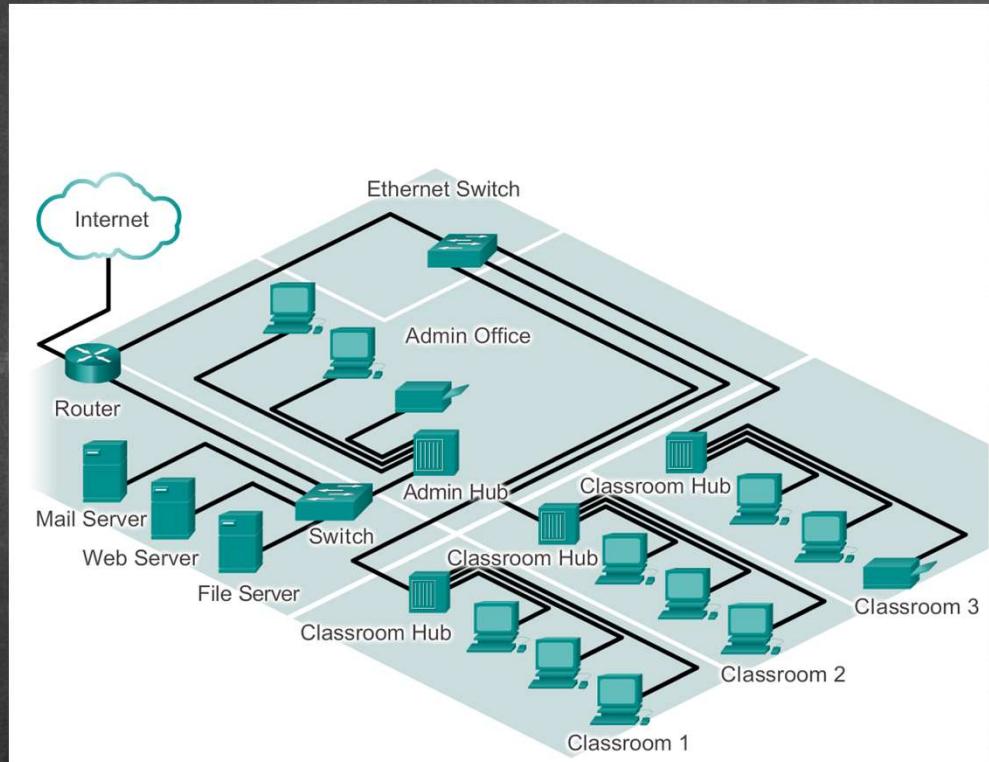
# Components of a Network

- Network Representations

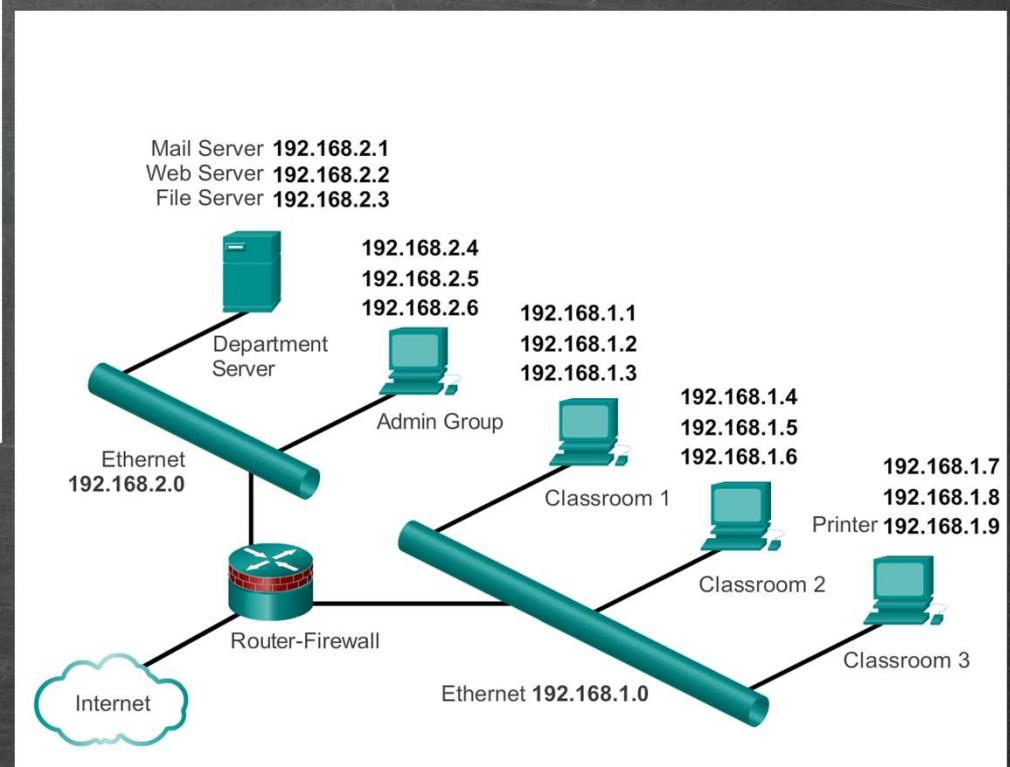


# Components of a Network

- Topology Diagrams



physical អ៊ូរូបតាមតម្លៃ

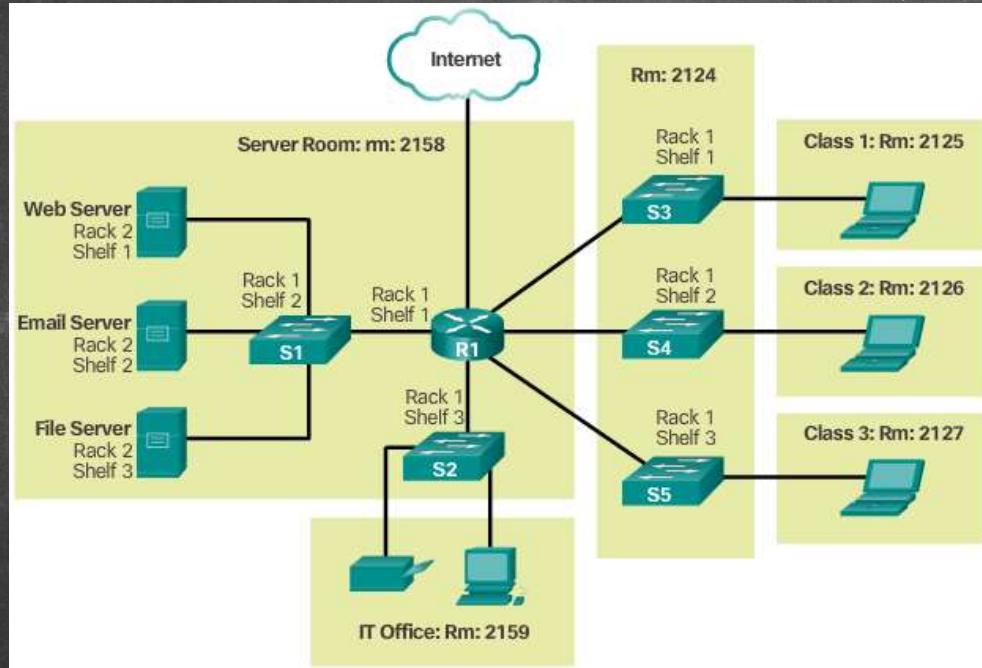


Logical និងអ្នកស្រួល Detail

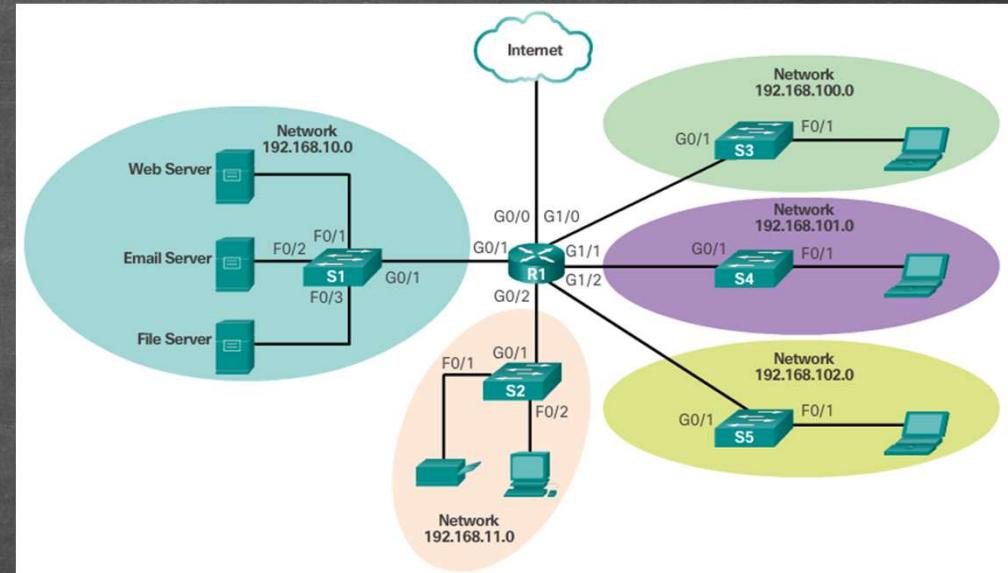
# Components of a Network

- Topology Diagrams

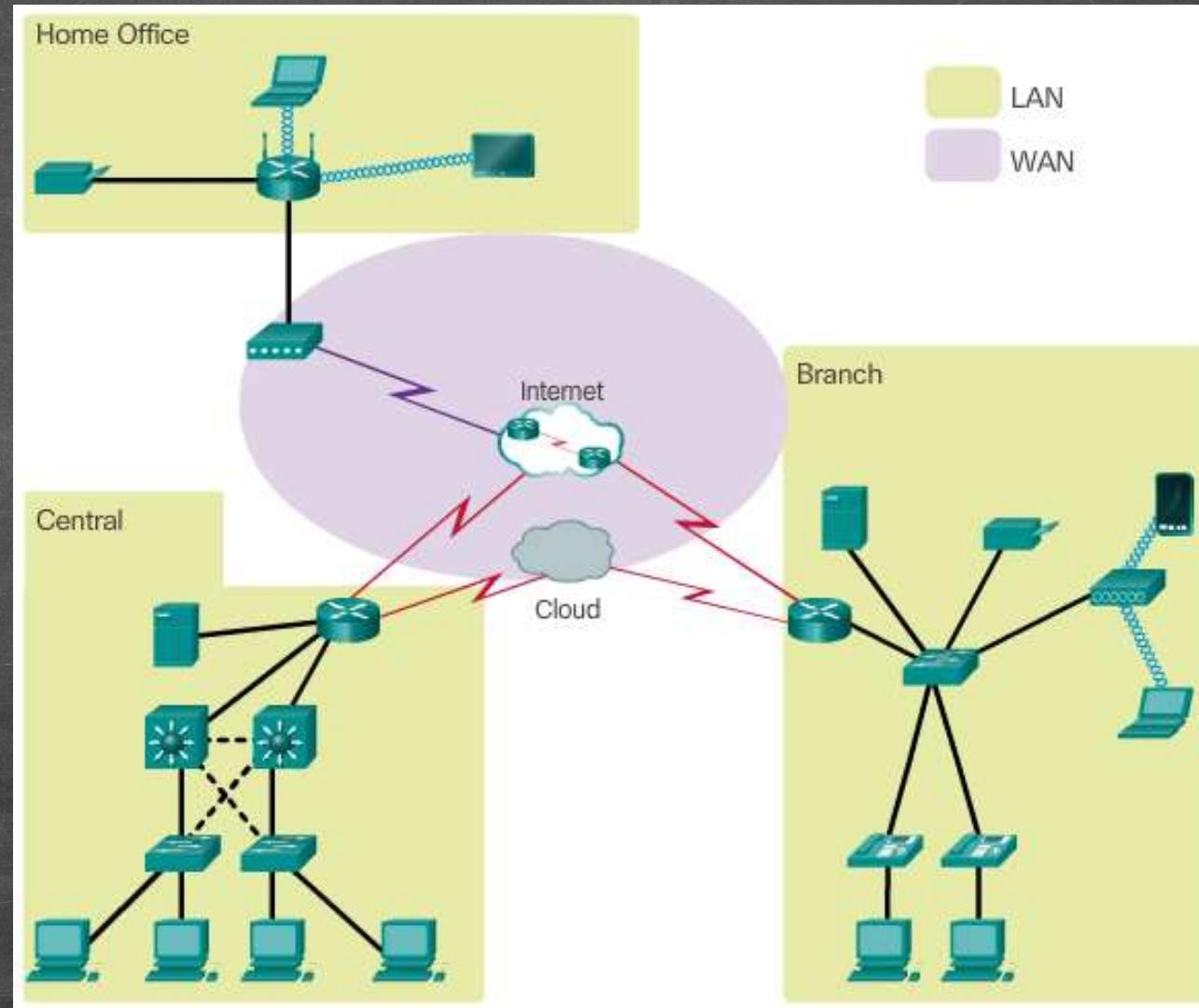
more physical



more logical



# 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

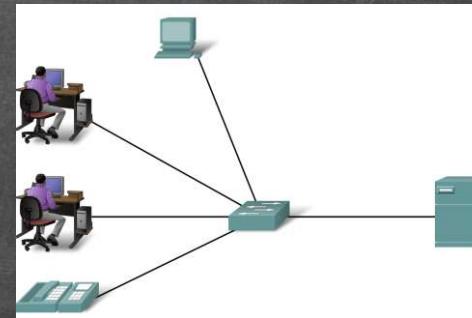
- The two most common types of network infrastructures are:

- 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) → ព័ត៌មានដែលបានផ្តល់នូវការនៅទីផ្សារ

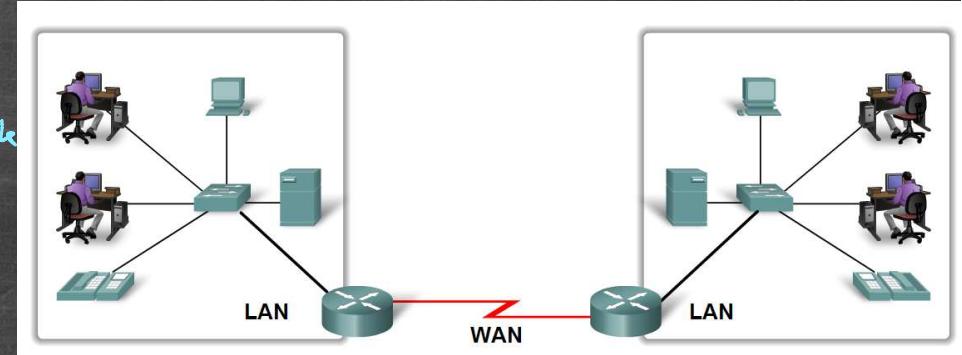
- Other types of networks include:

- Metropolitan Area Network (MAN)
- Wireless LAN (WLAN)
- Storage Area Network (SAN)
- Personal Area Network (PAN)
  - person area network
  - Bluetooth

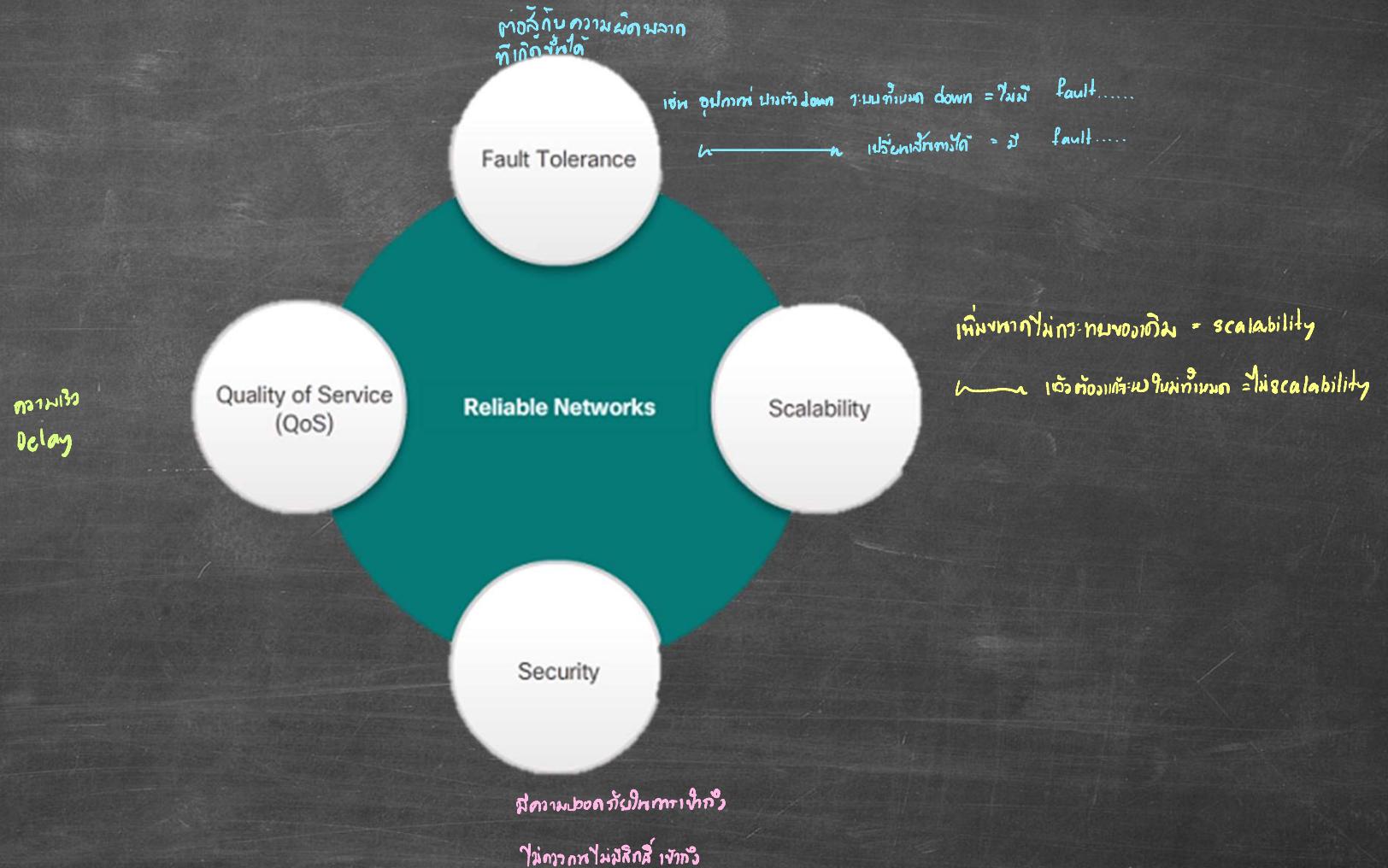
នាម admin និង group តើម្រកនា  
គឺចាន់, ភាពយោង



\* ភាពខ្សោយ នៃ ការបង្កើត LAN

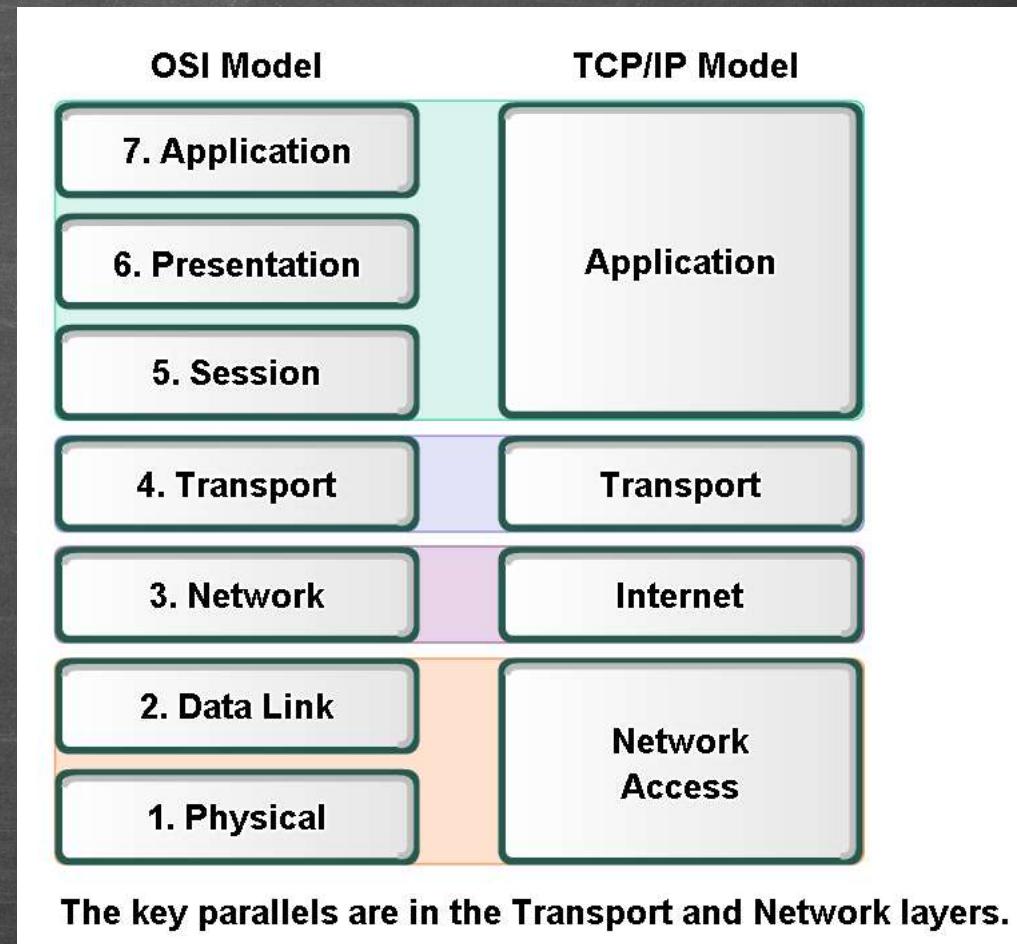


# Reliable Network



# 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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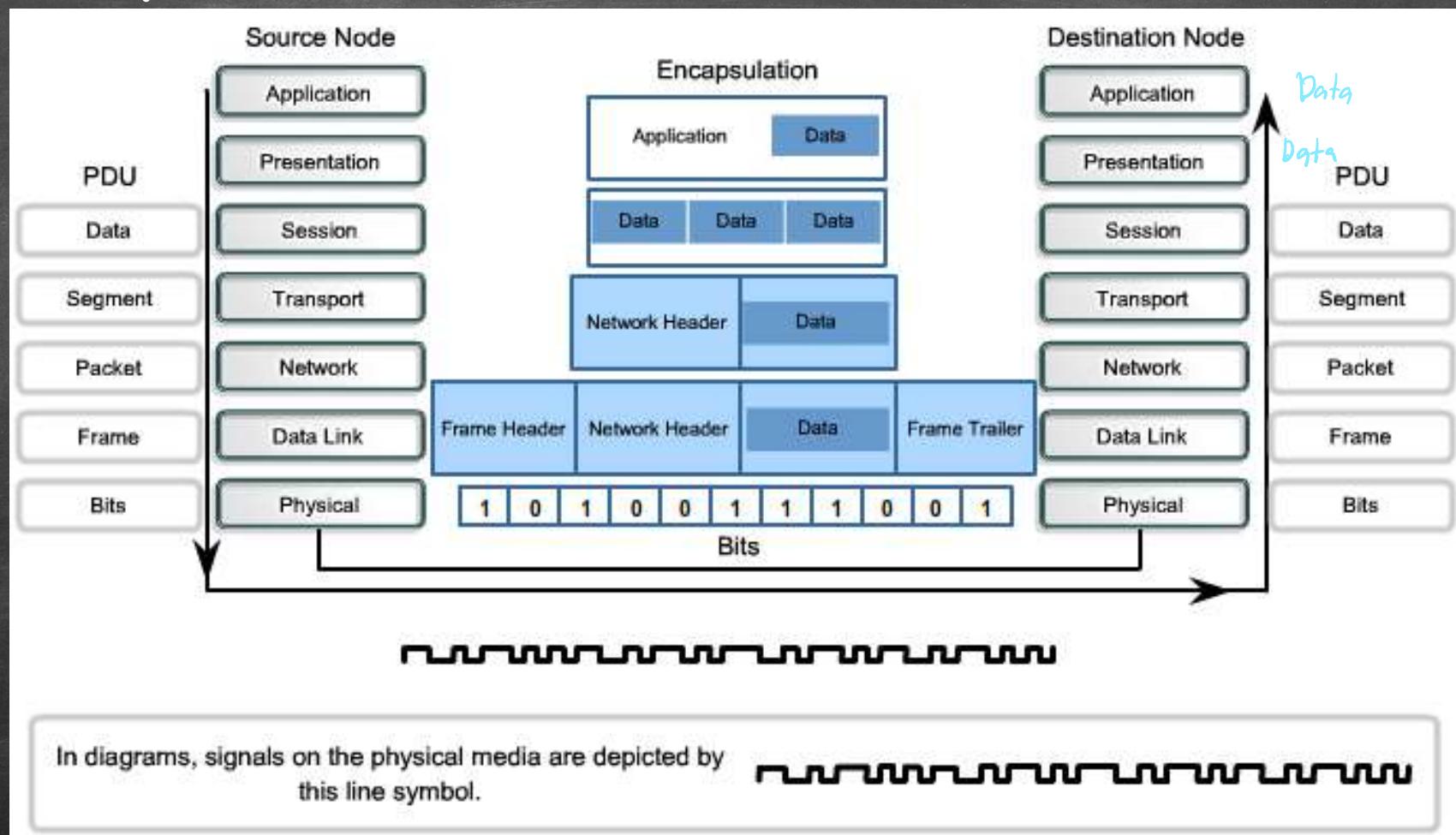
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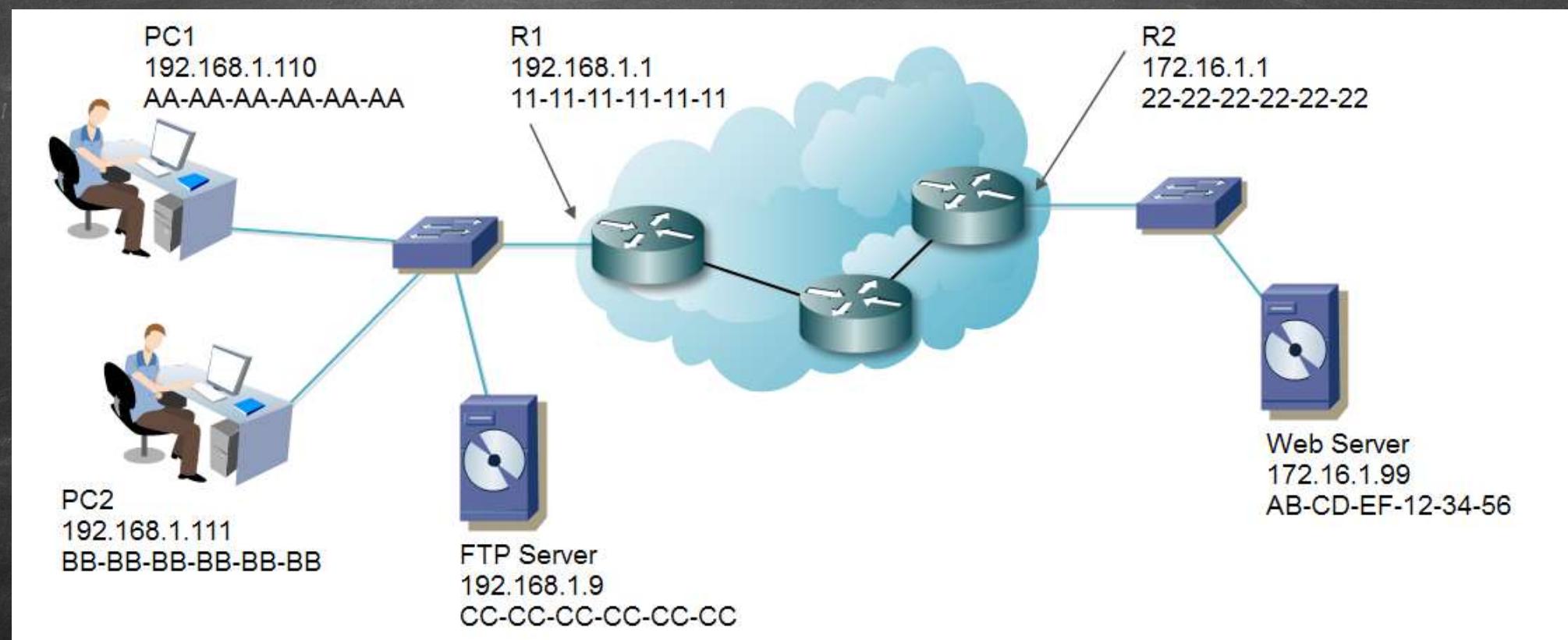
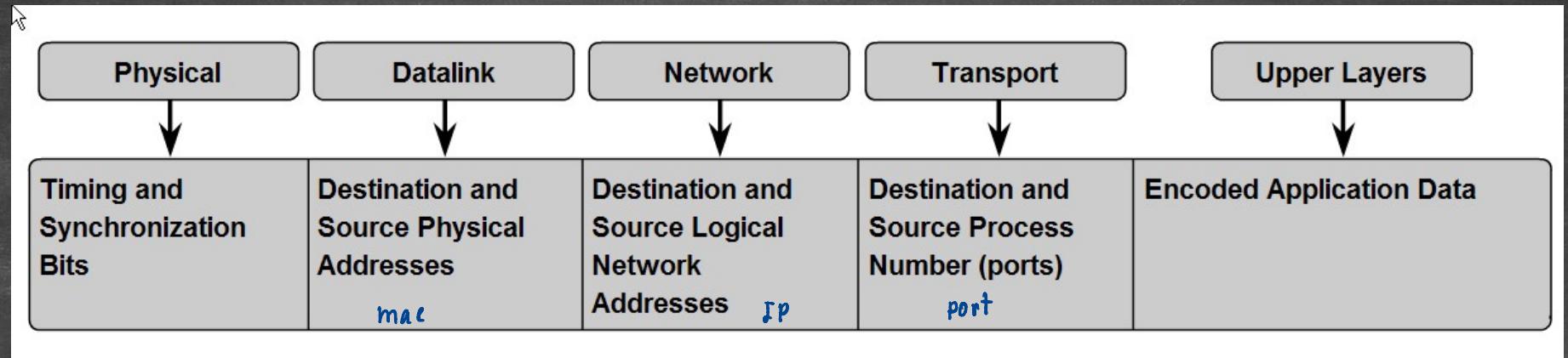
# Layers with TCP/IP and OSI Model

ຮ່ວມເຊັ່ນກວ່າດໍາລົງສົ່ງສາ ດົບໂດຍ ມີເຕີມ 1 ກ້ອນ

- Explain protocol data units (PDU) and encapsulation



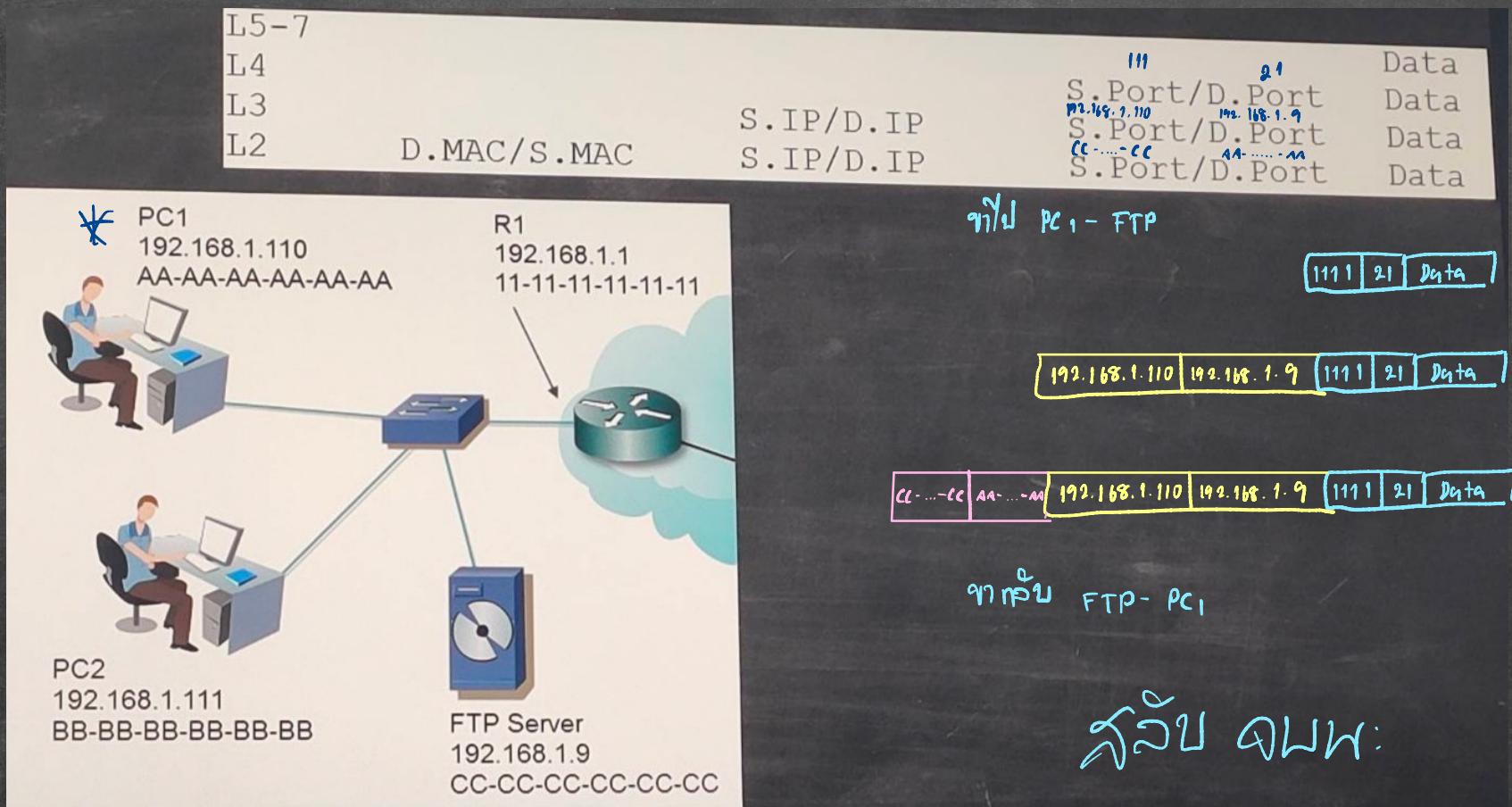
# Accessing Local Resources



# Accessing Local Resources

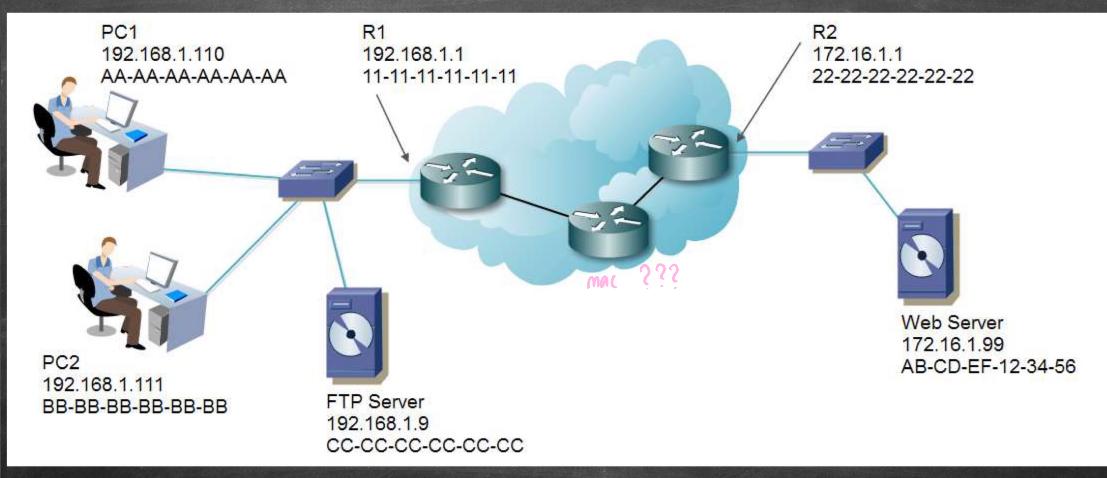
- PC1 => FTP Server

ເຖິງເສັ່ອມຕົວ 21 , ສ່ວນ Data 20



# Accessing Local Resources

- PC1 => Web Server



# Accessing Local Resources

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

# Intermediary network devices

- **Hub, Repeaters**

CSMA/CD (Carrier Sense Multiple Access with Collision Detection)

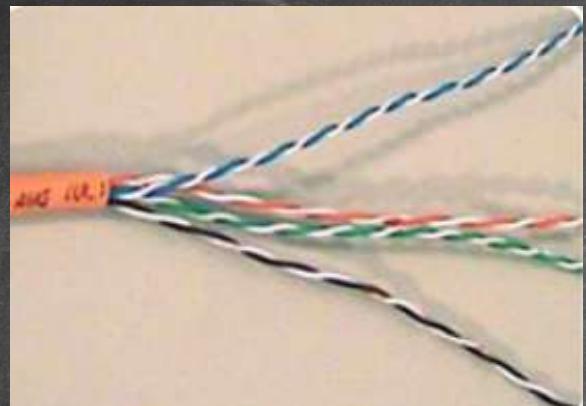
- **Switches, Bridges**

Learning / Flooding / Filtering / Forwarding / Aging

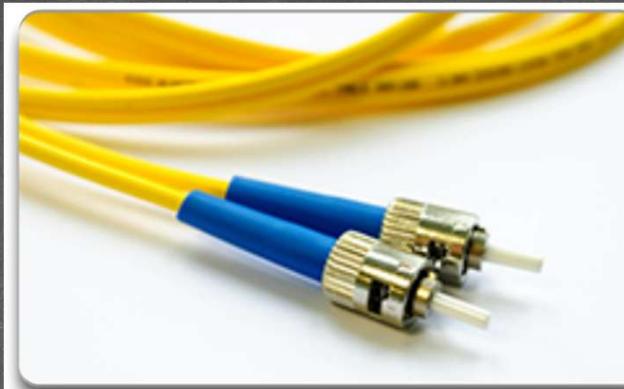
- **Routers**

Routing

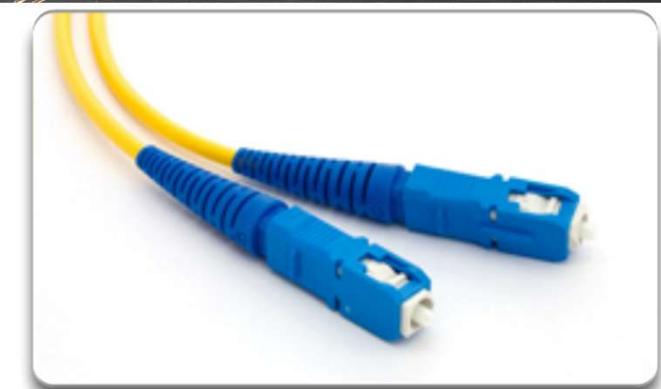
# Network Media



Unshielded Twisted Pair (UTP) cable



ST Connectors



SC Connectors

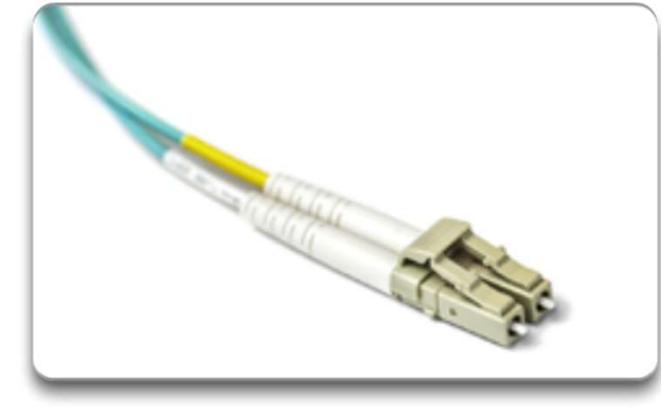
Optic



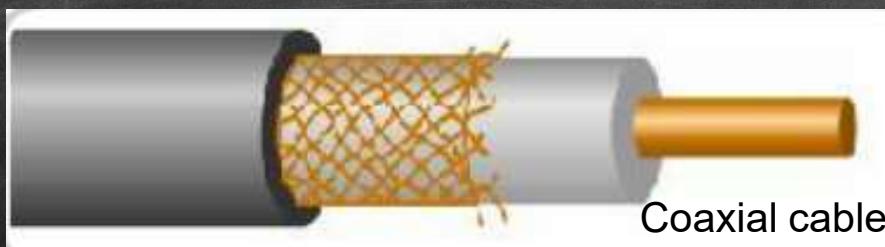
Shielded Twisted Pair (STP) cable



LC Connector



Duplex Multimode LC Connectors

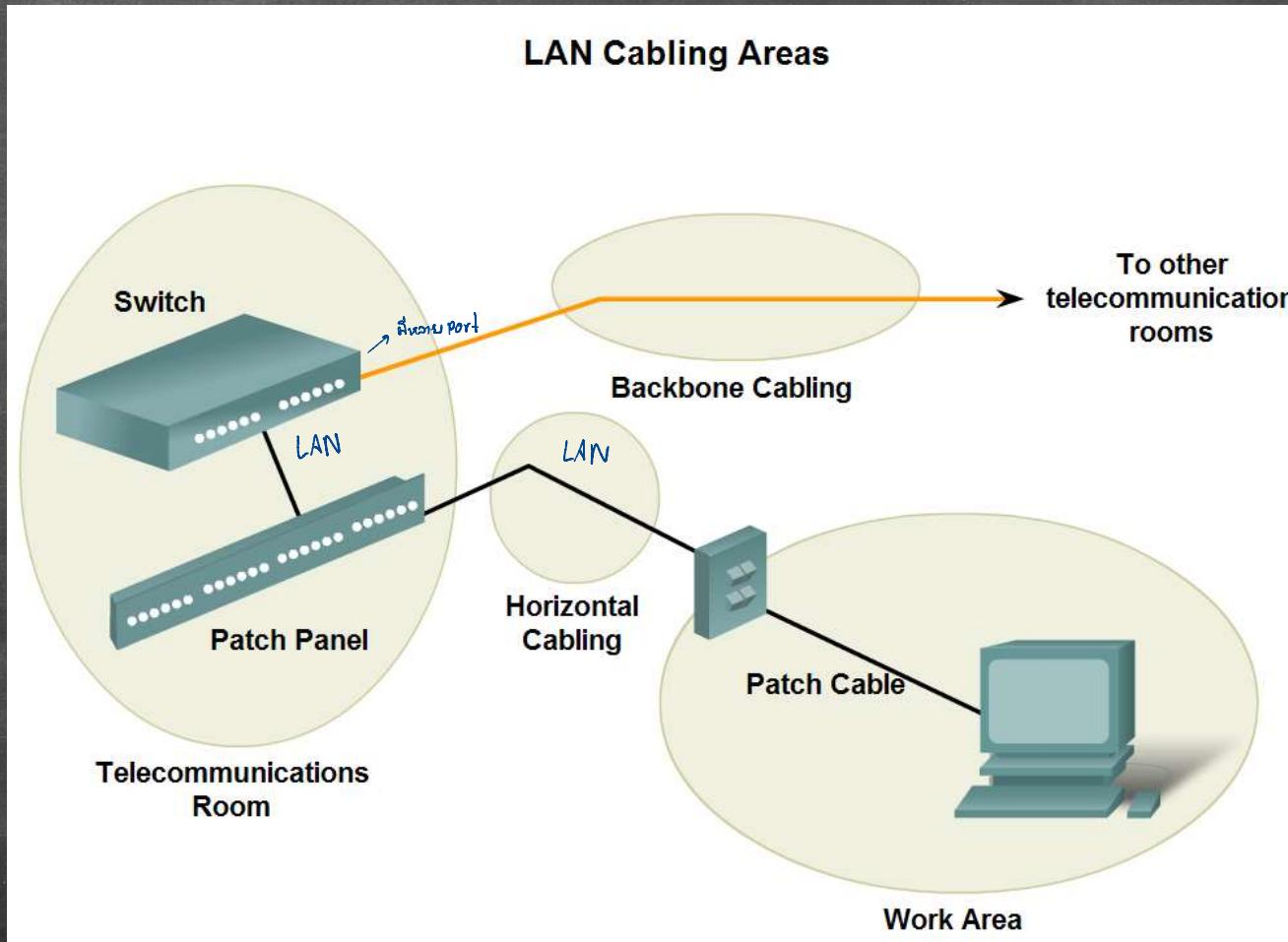


Coaxial cable



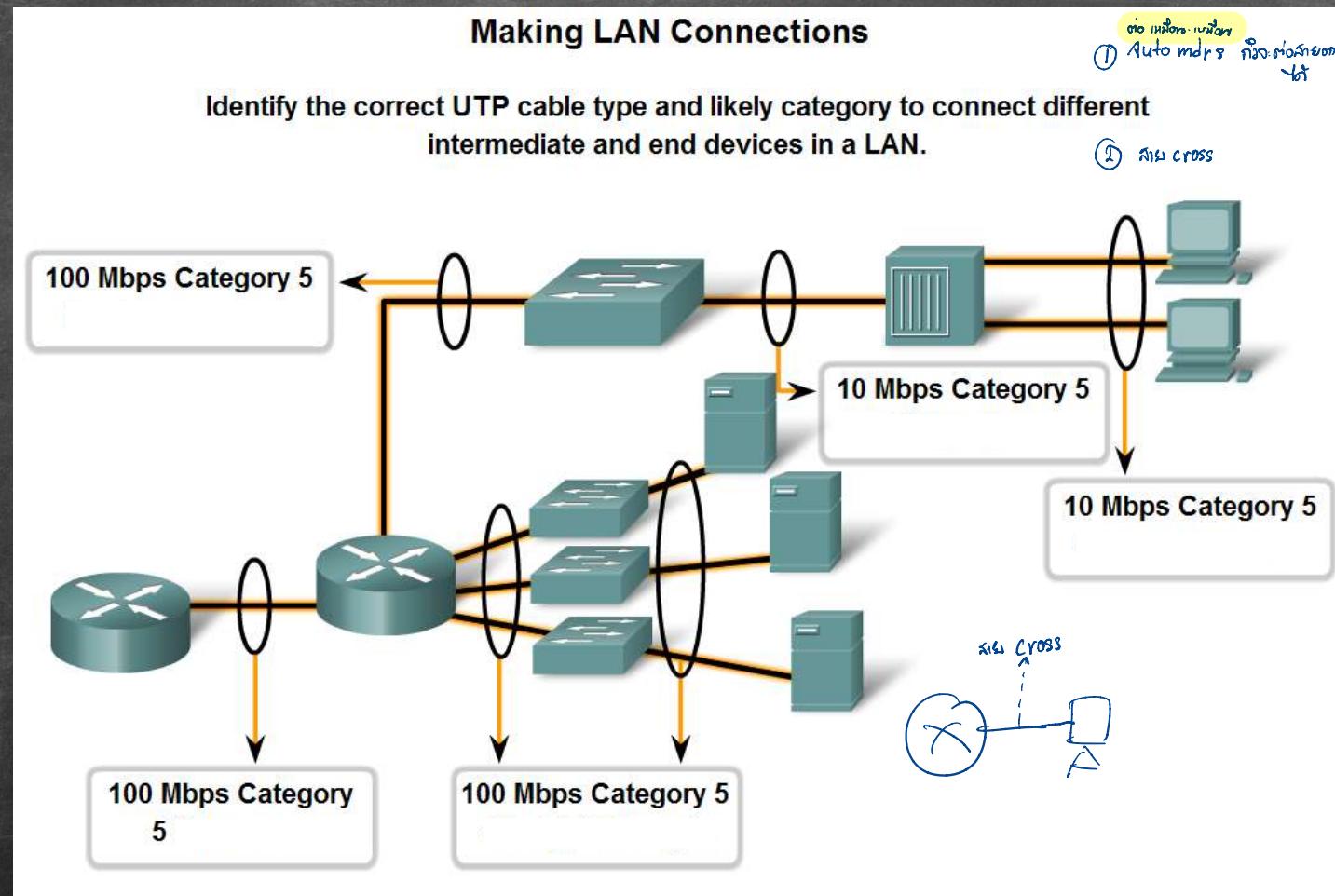
# Types of Connections in a LAN

- 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.



Use straight-through cables for connecting:

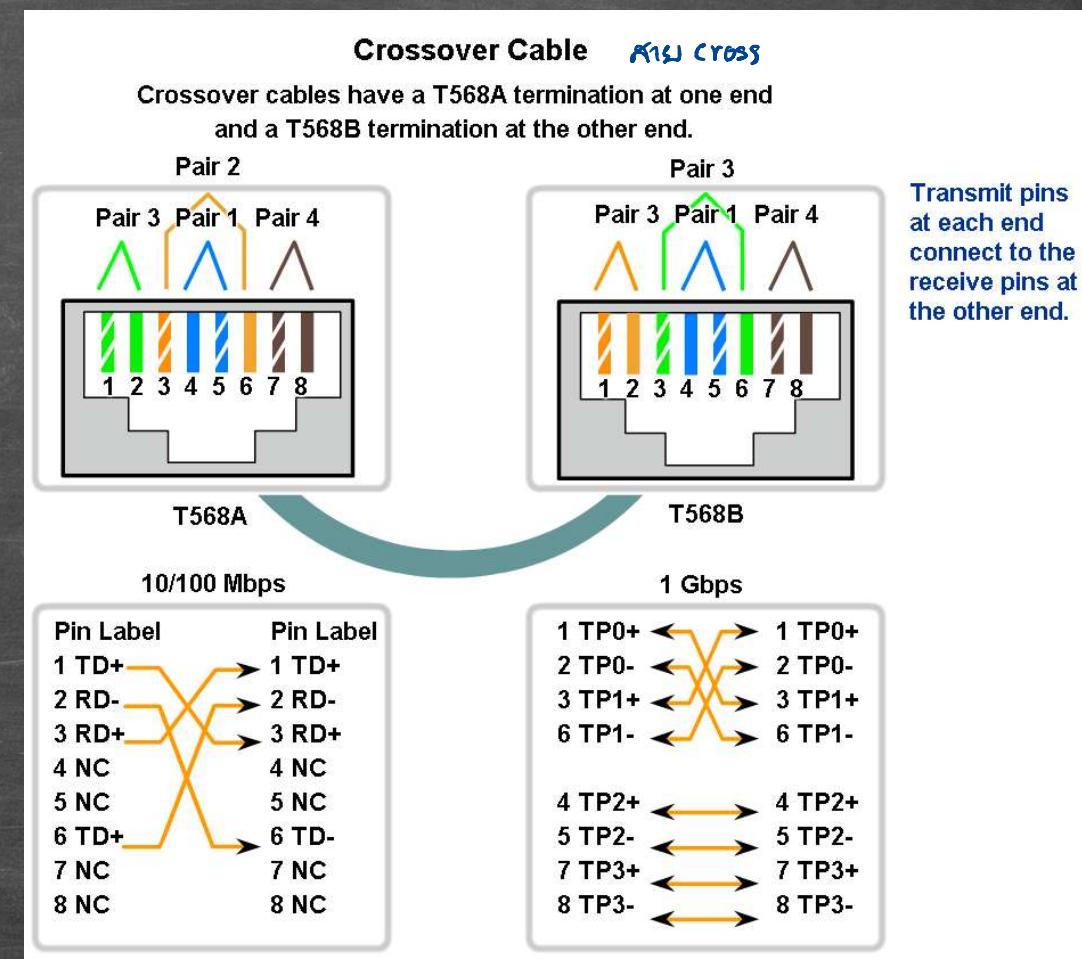
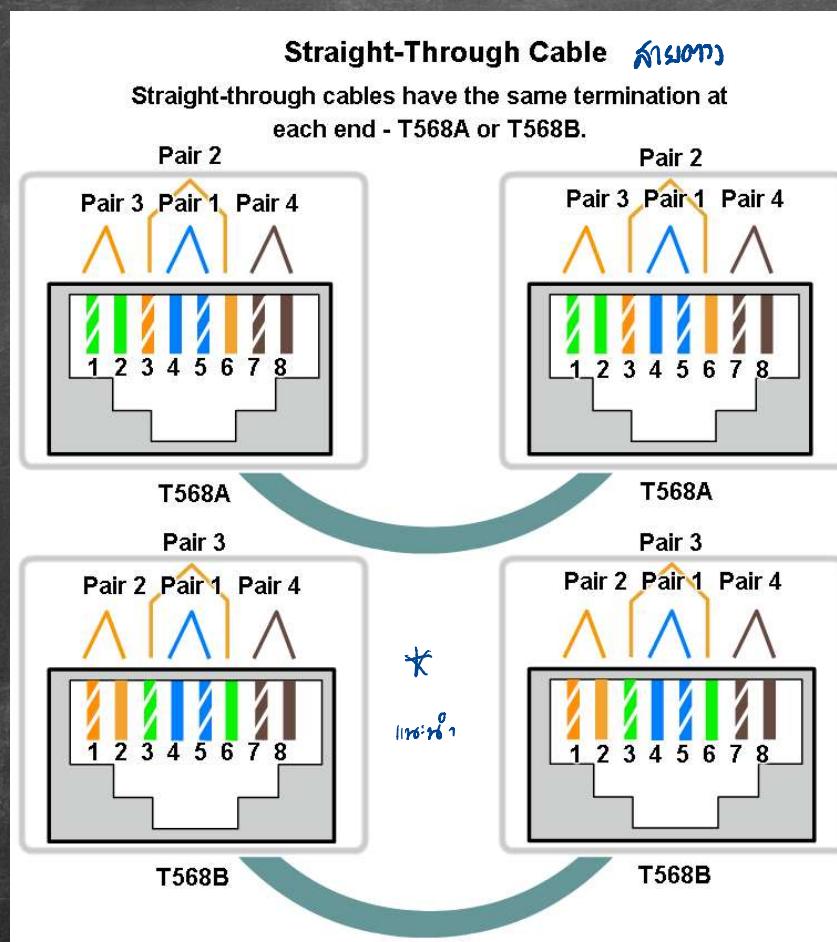
- Switch to router
- Computer to switch
- Computer to hub

Use crossover cables for connecting:

- Switch to switch
- Switch to hub
- Hub to hub
- Router to router
- Computer to computer
- Computer to router

# Types of Connections in a LAN

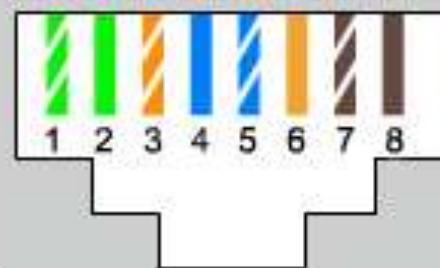
- Identify the pinout of the straight-through and cross-over cables



## RJ-45 T568A & T568B Termination

Pair 2

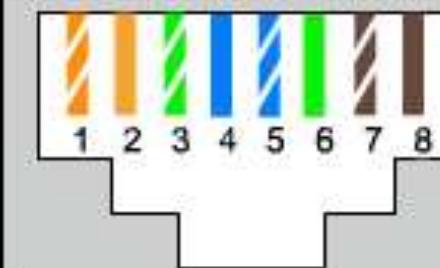
Pair 3      Pair 1      Pair 4



T568A

Pair 3

Pair 2      Pair 1      Pair 4



T568B



T568A

(Top View)

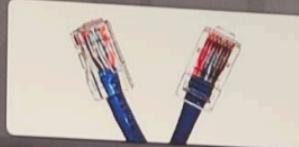


T568B

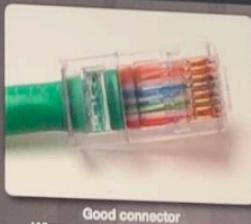
(Top View)

### RJ-45 UTP Plugs

altice  
cisco



Bad connector  
Wires are exposed, untwisted, and not entirely covered by the sheath.



Good connector  
Wires are untwisted to the extent necessary to attach the connector.

### RJ-45 UTP Sockets



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# Types of Connections in a LAN

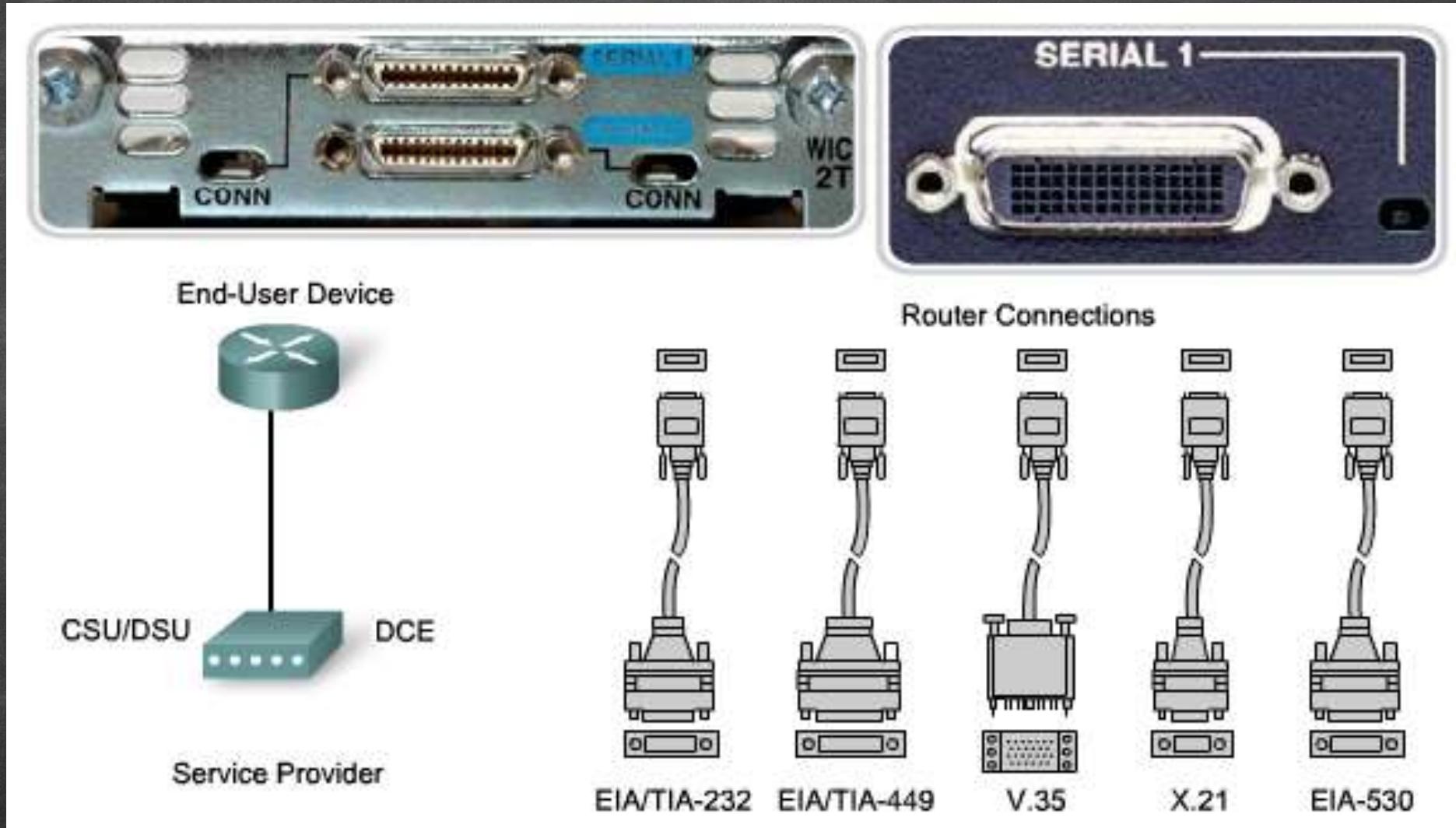
- Recognize that a different class of cables is used to connect WANs, and that the cables, standards and ports are different than those in use by LANs.

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			
						
<b>Router: Male Smart Serial</b>			<b>Network: Male Winchester Block Type</b>			

# Types of Connections in a LAN

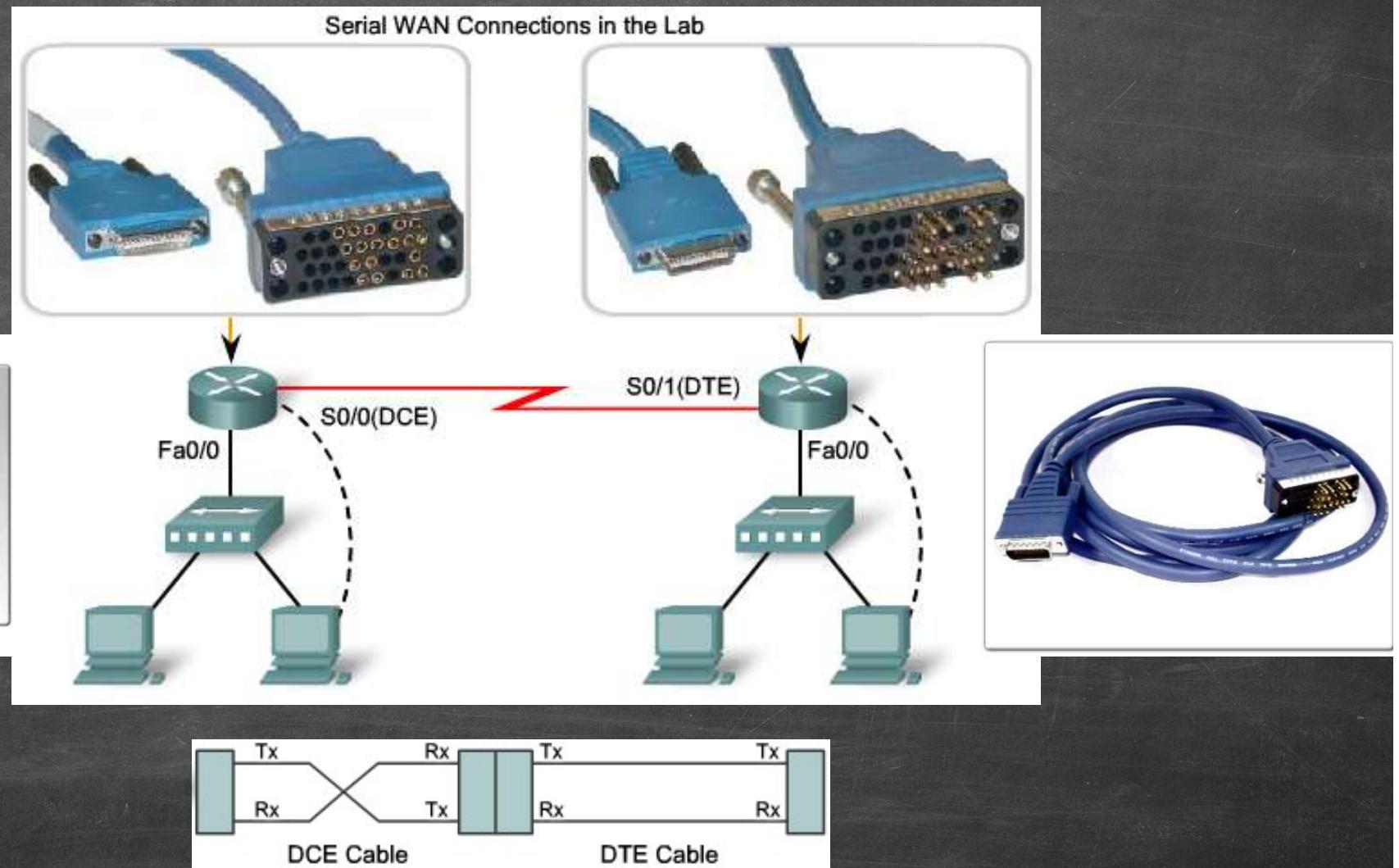
Smart serial

จิรศักดิ์



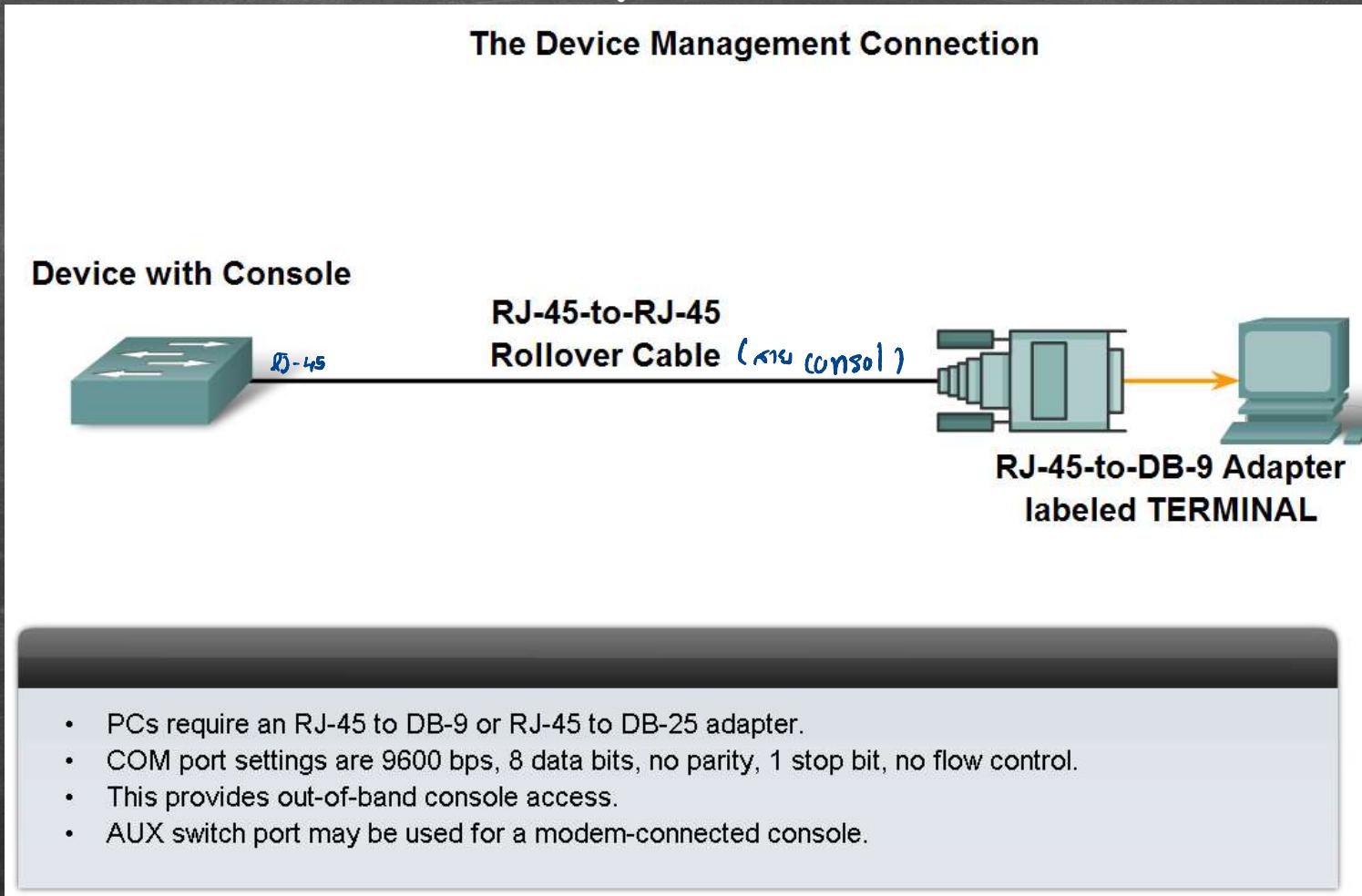
# Types of Connections in a LAN

- Making WAN Connections



# Types of Connections in a LAN

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



# Questions and Answers

