Computer Network Components

Presented by Hung Ba Ngo

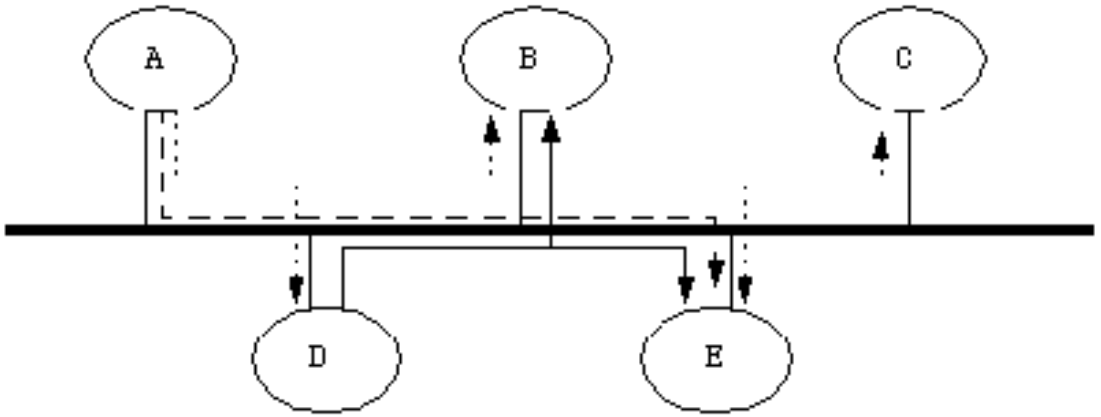
Computer Network Components

- Types of computer networks
- Computer network architecture
- Hierarchy of computer network protocols
- Open System Interconnection Model

Type of Computer Networks

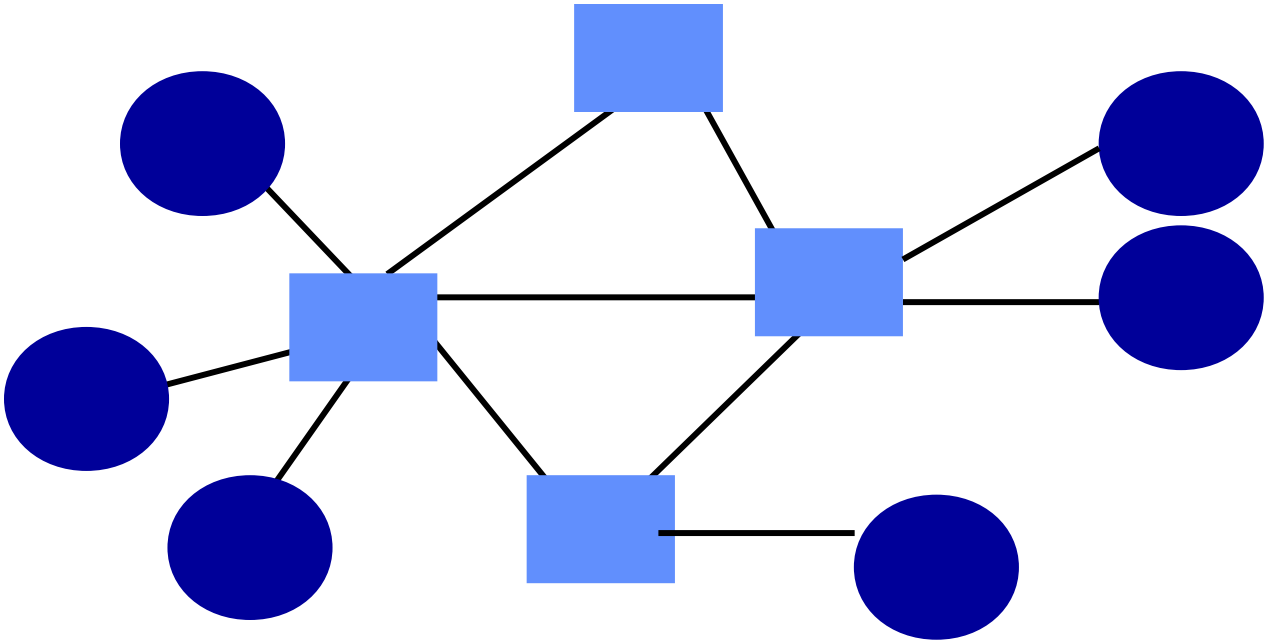
Classifying Computer networks by data transmission method

- Broadcasting Network



Classifying Computer networks by data transmission method

- Switched Network

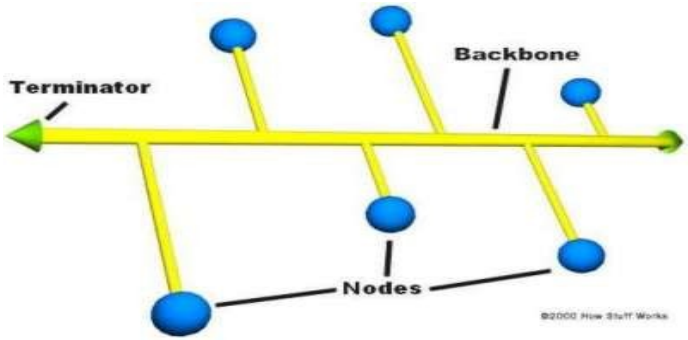


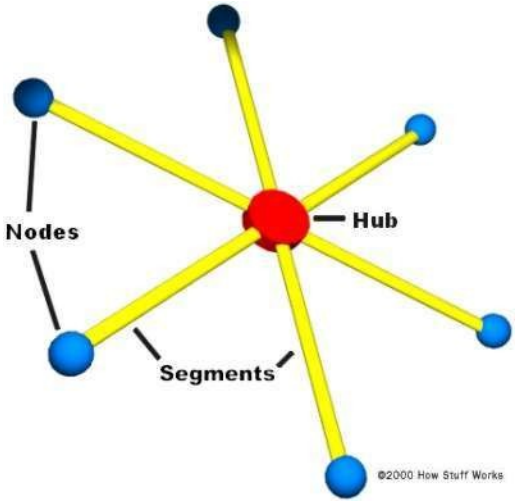
Classifying Computer networks by network diameter

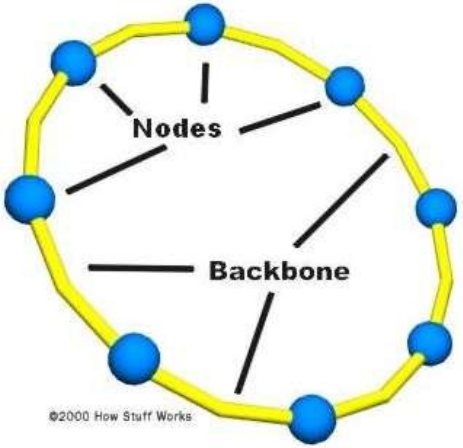
Diameter	Host location	Network Types
1 m	In a square meter	PAN - Personal Area Network
10 m	In a room	LAN - Local Area Network
100 m	In a building	
1 km	In a campus	
10 km	In a city	MAN - Metropolitan Area Network
100 km	In a country	WAN - Wide Area Network
1000 km	In a continent	

LAN-Local Area Network

- Broadcast network
- High bandwidth network
- Topology: Bus, Star, Ring

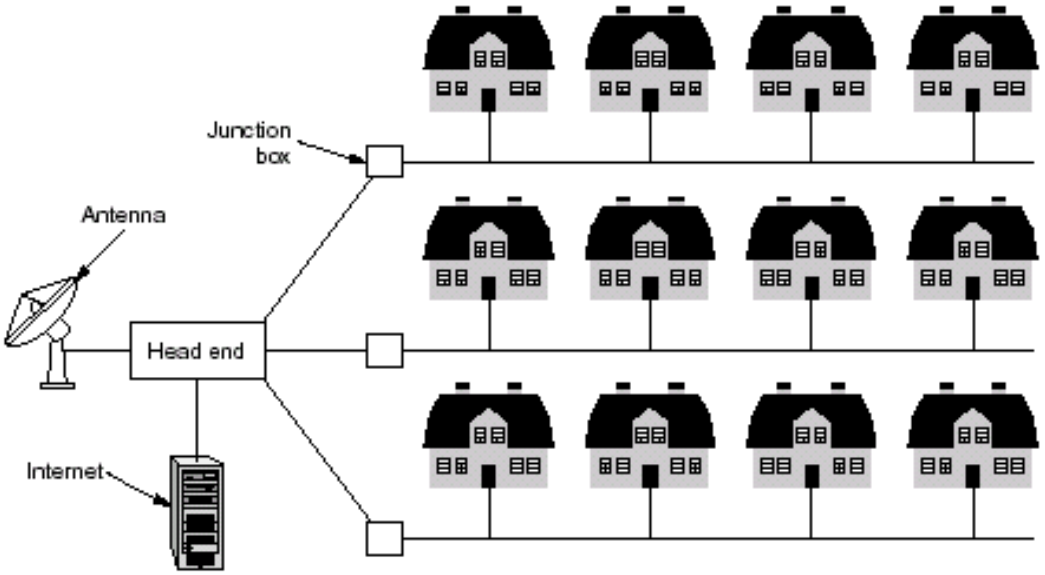






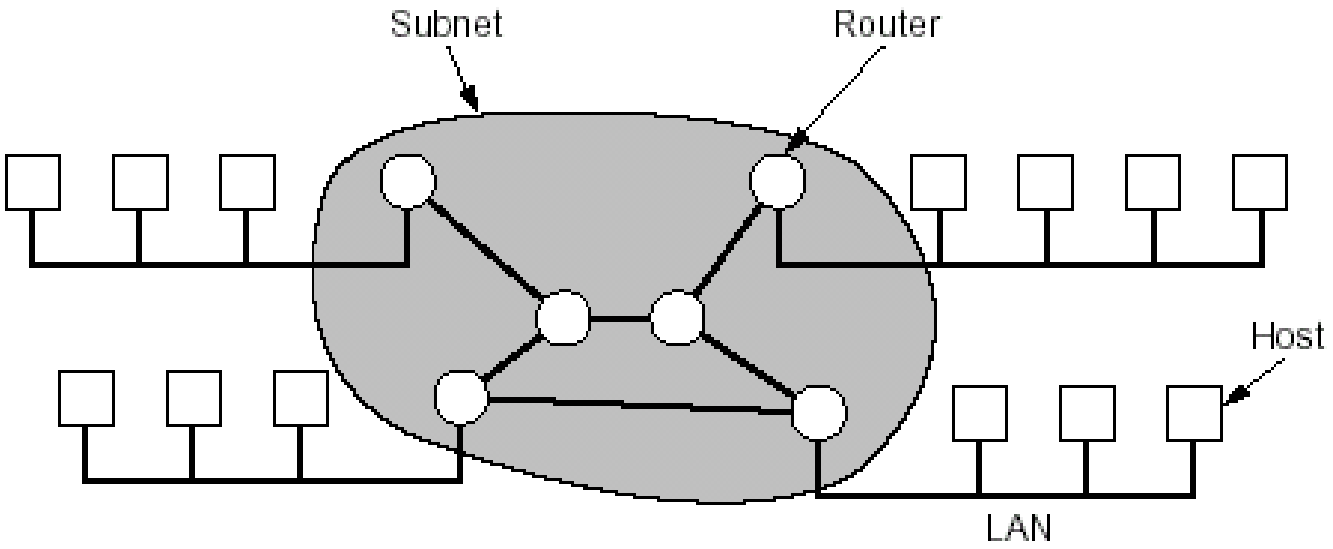
MAN-Metropolitan Area Network

- Scope of city: Cable television network



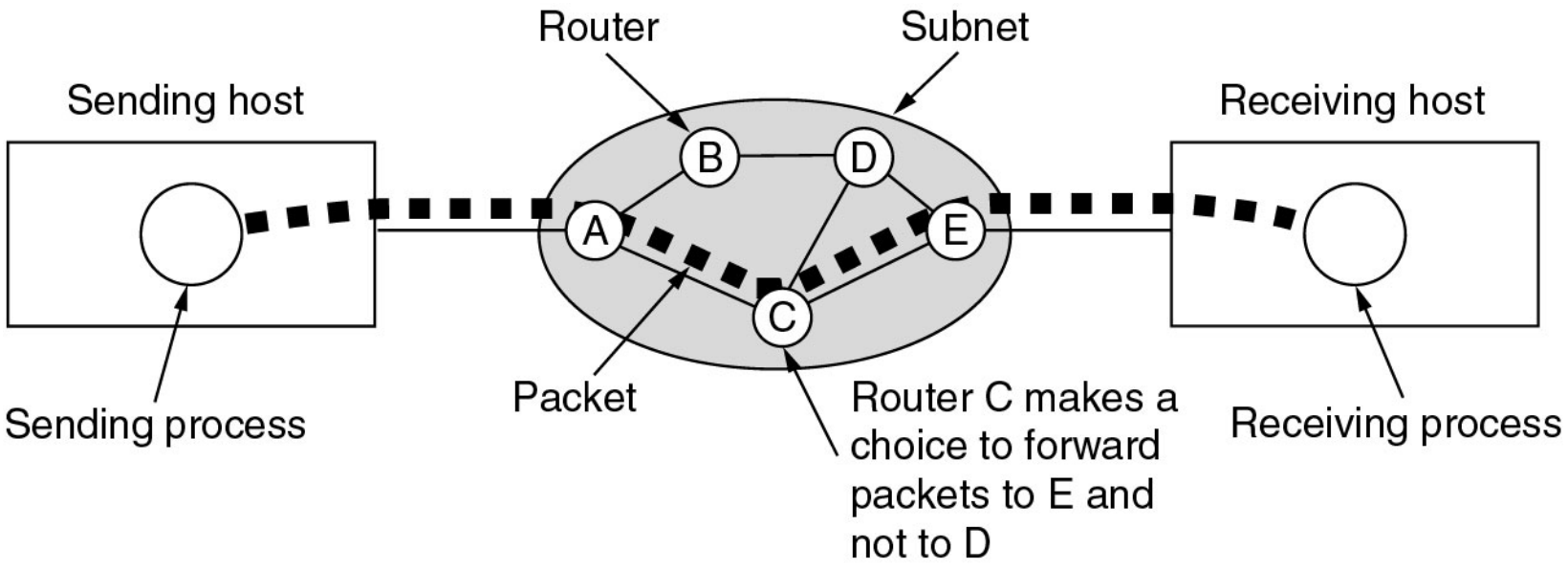
WAN – Wide Area Network

- Extend a network in:
  - Number of hosts
  - Network diameter



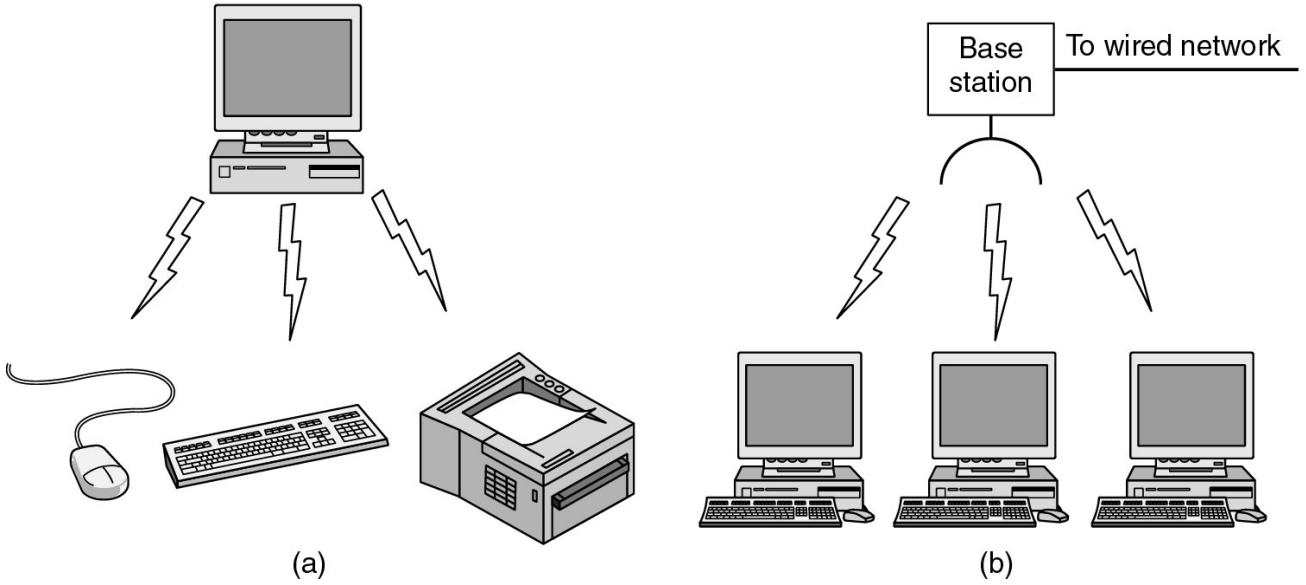
WAN – Wide Area Network

- Store and Forward technique



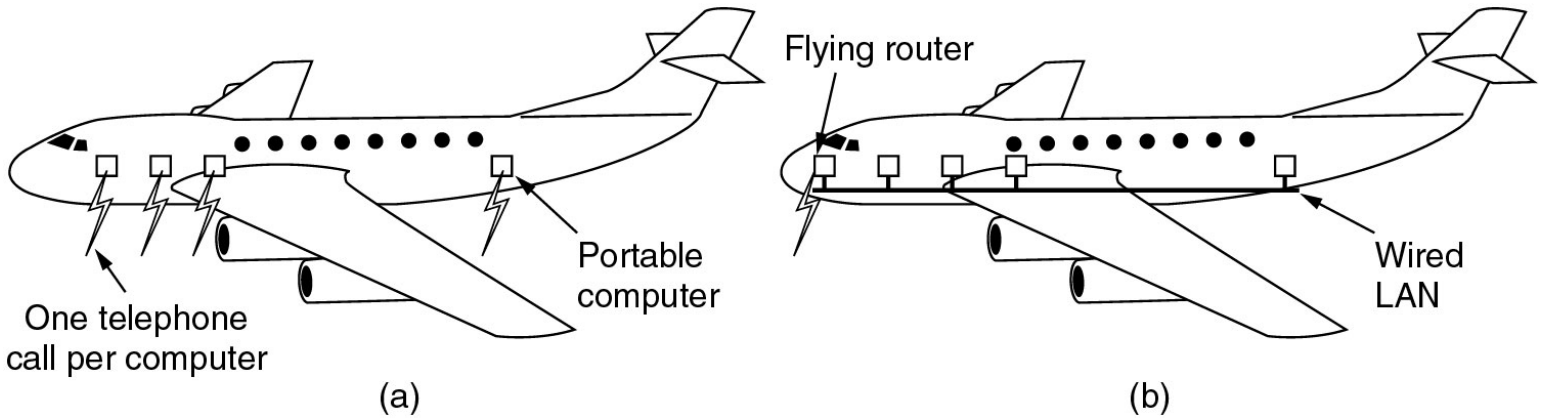
Wireless Network

- (a) Wireless devices
- (b) Wireless LAN



Wireless Network

- Wireless WAN



Internetwork

- A network formed by inter-connecting several heterogeneous (hardware, software) networks
  - LAN = LAN + LAN
  - WAN = LAN + LAN
  - WAN = WAN + WAN

Soft Architecture of Computer Networks

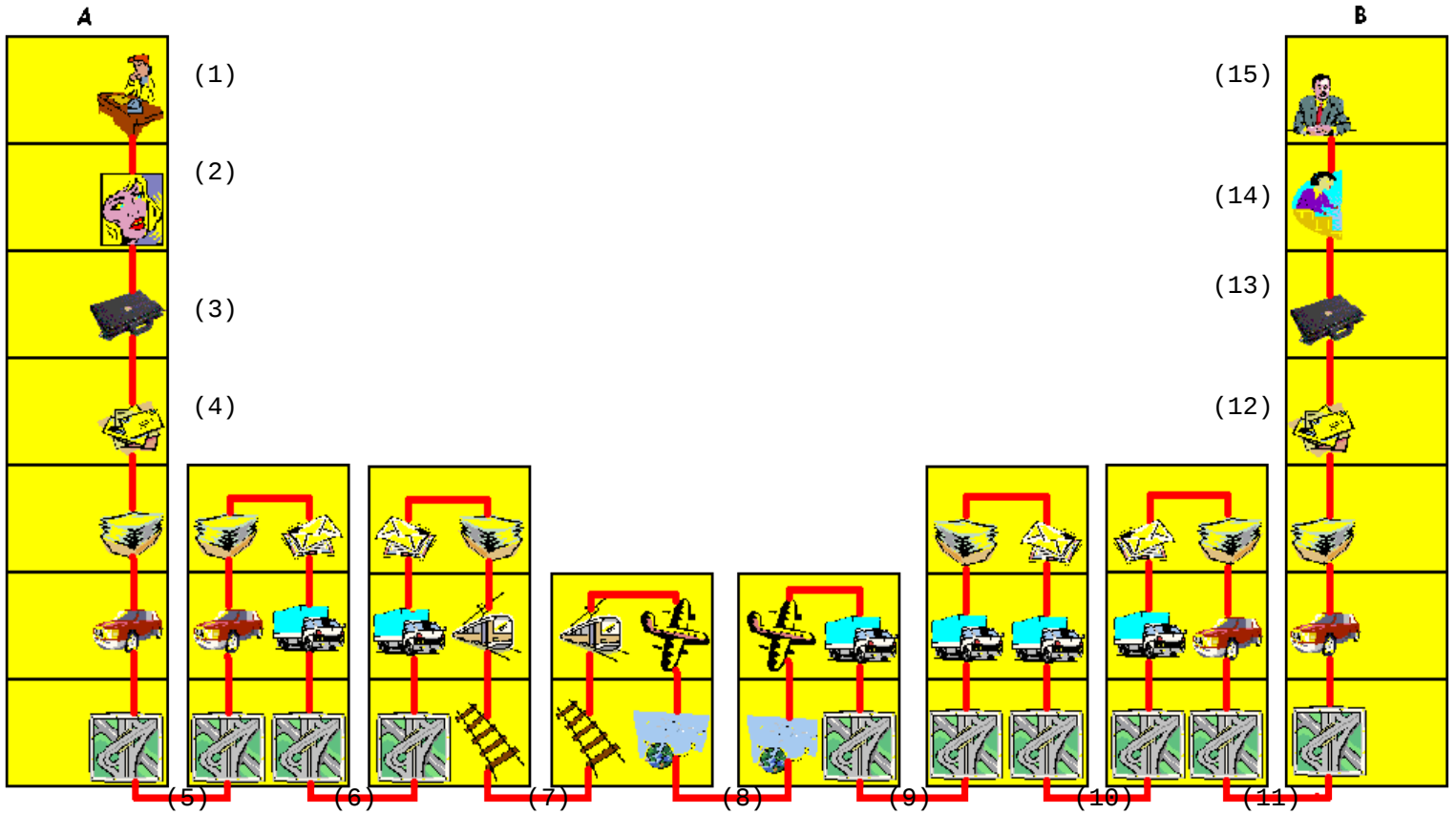
Soft component of computer networks

- Service: What a component can provide for other components
- Interface: How/the way a component can access services provided by other component
- Protocol: a formal set of rules, conventions and data structure that governs how computers and other network devices exchange information over a network

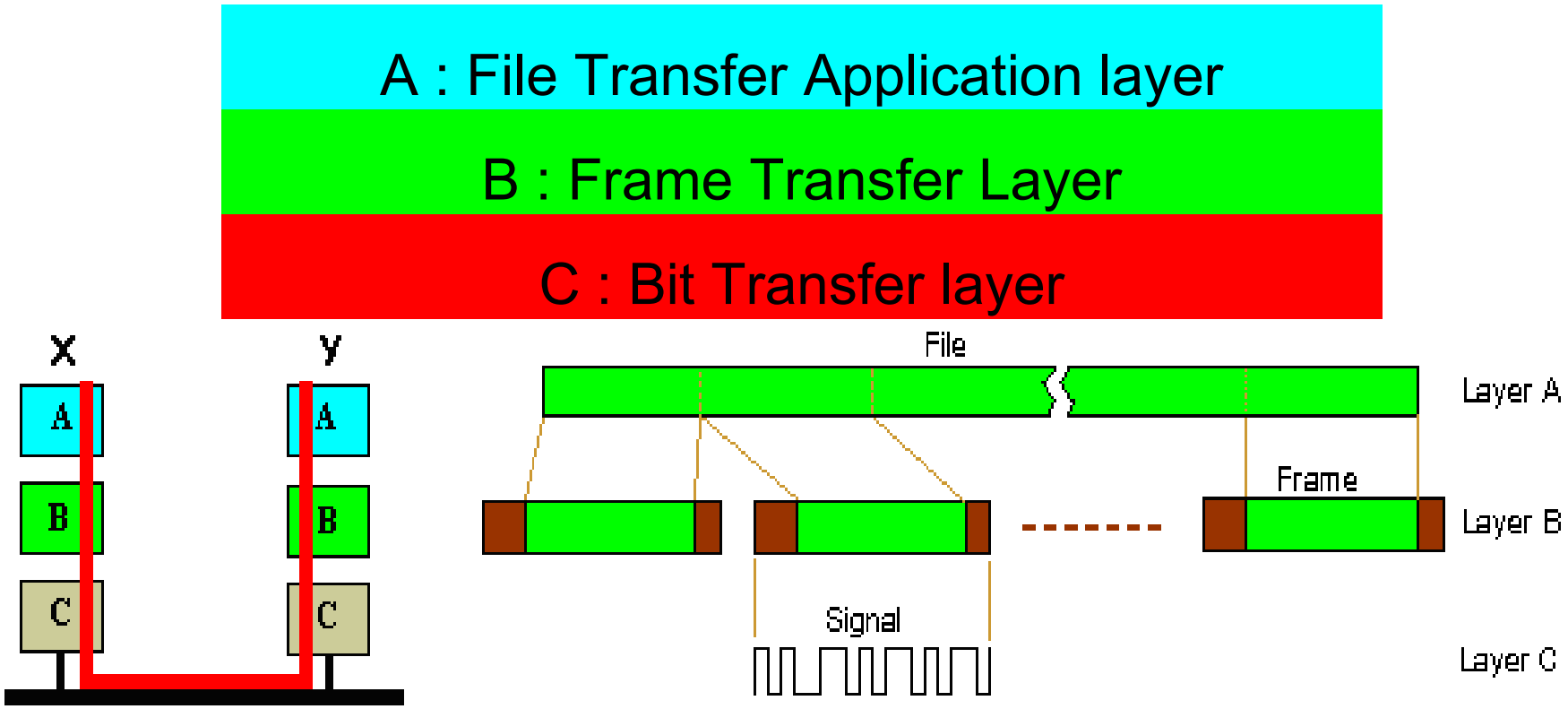
Hierarchy of computer network protocols

- Relative services are grouped into a layer
- Entities in a layer use services provided by under adjacent-layer to accomplish their functions
- Two entities of two computer systems at the same layer have to use the same protocol to exchange data
- A protocol specifies rules for exchanging information: data format, handshaking, error detecting and handling, ...

International Postal System



Three layer file transfer model



Network Service Types

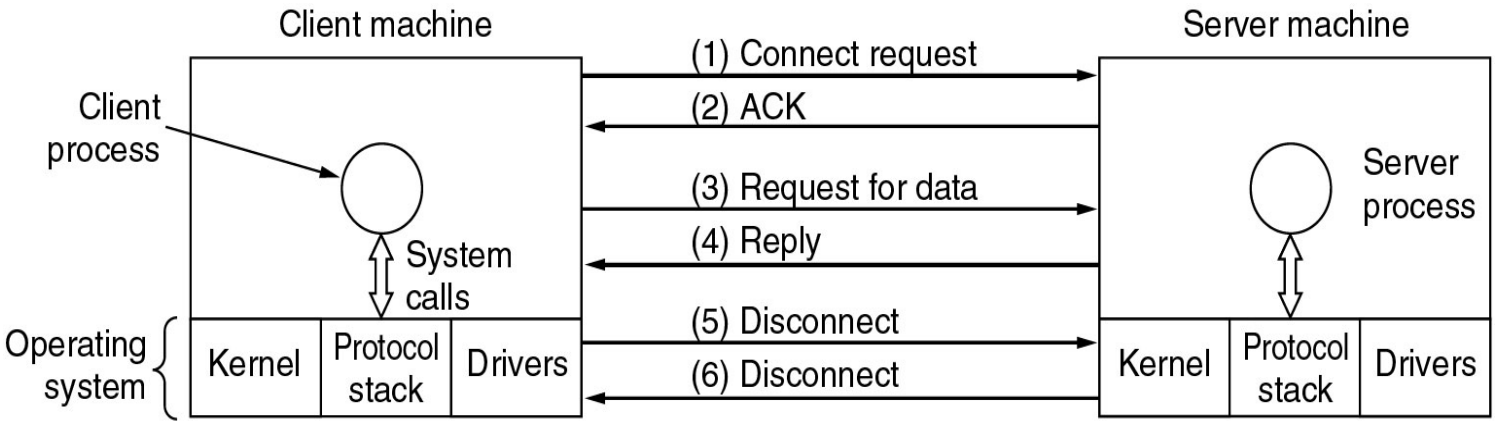
- Connection-oriented services
  - Model of telephone network
  - Establish and terminate communication channel
- Connectionless services
  - Postal model
  - Data sent in packets
  - Packet header contains address of receiver

Primitives of connection oriented services

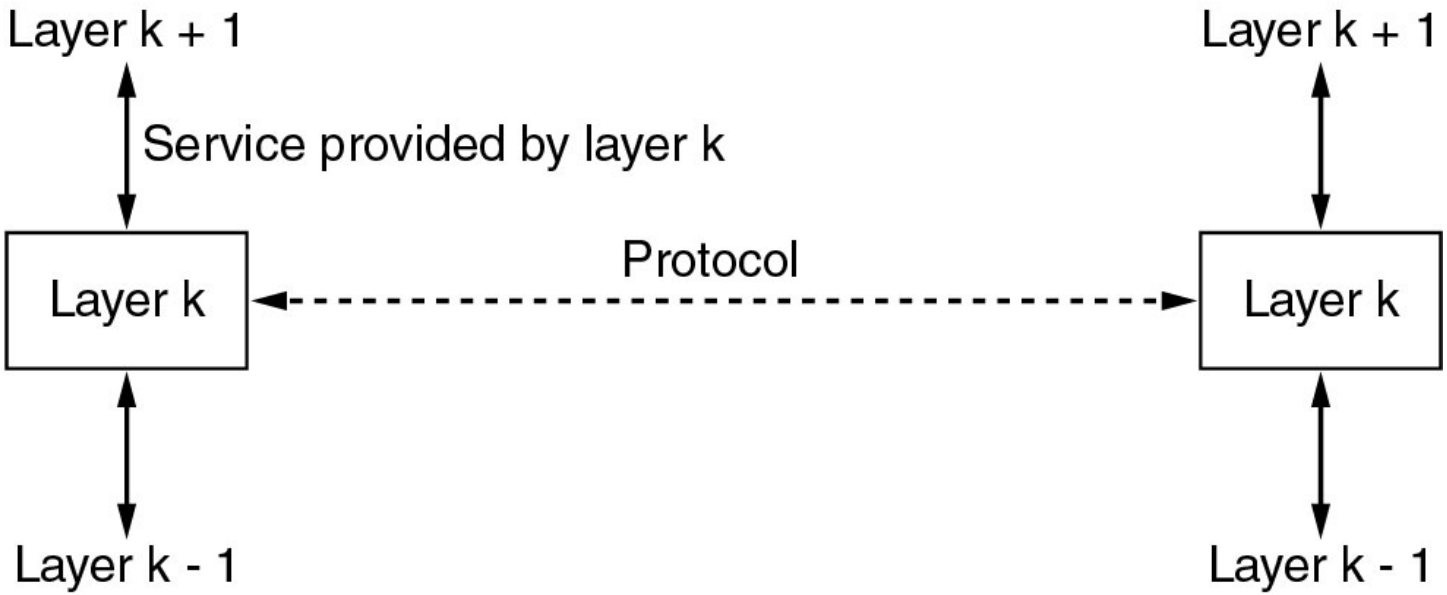
Primitives	Function
LISTEN	Block and wait for a connection request
CONNECT	Request to establish a connection
RECIEVE	Block and wait for a message arrival
SEND	Send a message
DISCONNECT	Terminate a connection

Primitives of connection oriented services

Server	Client
LISTEN	
	CONNECT
RECIEVE	SEND
SEND	RECIEVE
DISCONNECT	DISCONNECT



Services & Protocols



Bài tập

1. Hãy viết một lá thư không ít hơn 20 từ bằng mã Morse và gởi cho bạn mình
2. Hãy cho một ví dụ minh họa các khái niệm Dịch vụ, giao thức và giao diện
3. Hãy cho một ví dụ minh họa cách thức giao tiếp giữa 2 thành phần theo 2 chế độ: Có nối kết và không nối kết