

Contents Delivery Systems

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SookMyung Women's University

멀티미디어 과학전공

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Main Text and References

- Main Text
 - No text Book
 - 웹상에서 수집
 - References
 - 강의 시간 중에 언급한 내용에 대한 각자의 정리
- ➔ 주 강의 교재 및 참고 자료는 웹 상에서 수집할 것
- ➔ 이 분야의 자료는 매일 매일 새롭게 변화고 있음.
- ➔ 따라서, 주 교재 및 참고교재는 없음.

Schedule

- Chap 0 : Overview of DC/CN (1주)
- Chap 1 : Multimedia communications (2-3 주)
- Chap 5 : Standards for Contents Delivery Systems (4-5주)
- Chap 6 : Digital communication basics (6-7주)
- Chap 7 : Wide Area Networks (WAN) 기술(8주)
- 중간고사 (9주)
- Chap 8 : Local Area Network (LAN 기술) (10-12주)
- Chap 9 : Internet Protocol (13-14주)
- 기말고사 (15주)

- Chap 12 : Transport Protocols (2학기: Network programming)
- Chap 13 : Application support functions (2학기: Network programming)
- Mobile Computing(2학기: Mobile application and programming)

Contents Delivery Systems

- Contents 의 정의
 - Type, size, usage of contents
 - What, who, when, why, how, where
- Delivery의 정의
 - What, who, when, where, how, why
- Systems의 정의
 - 소프트웨어
- Contents Delivery Systems의 정의

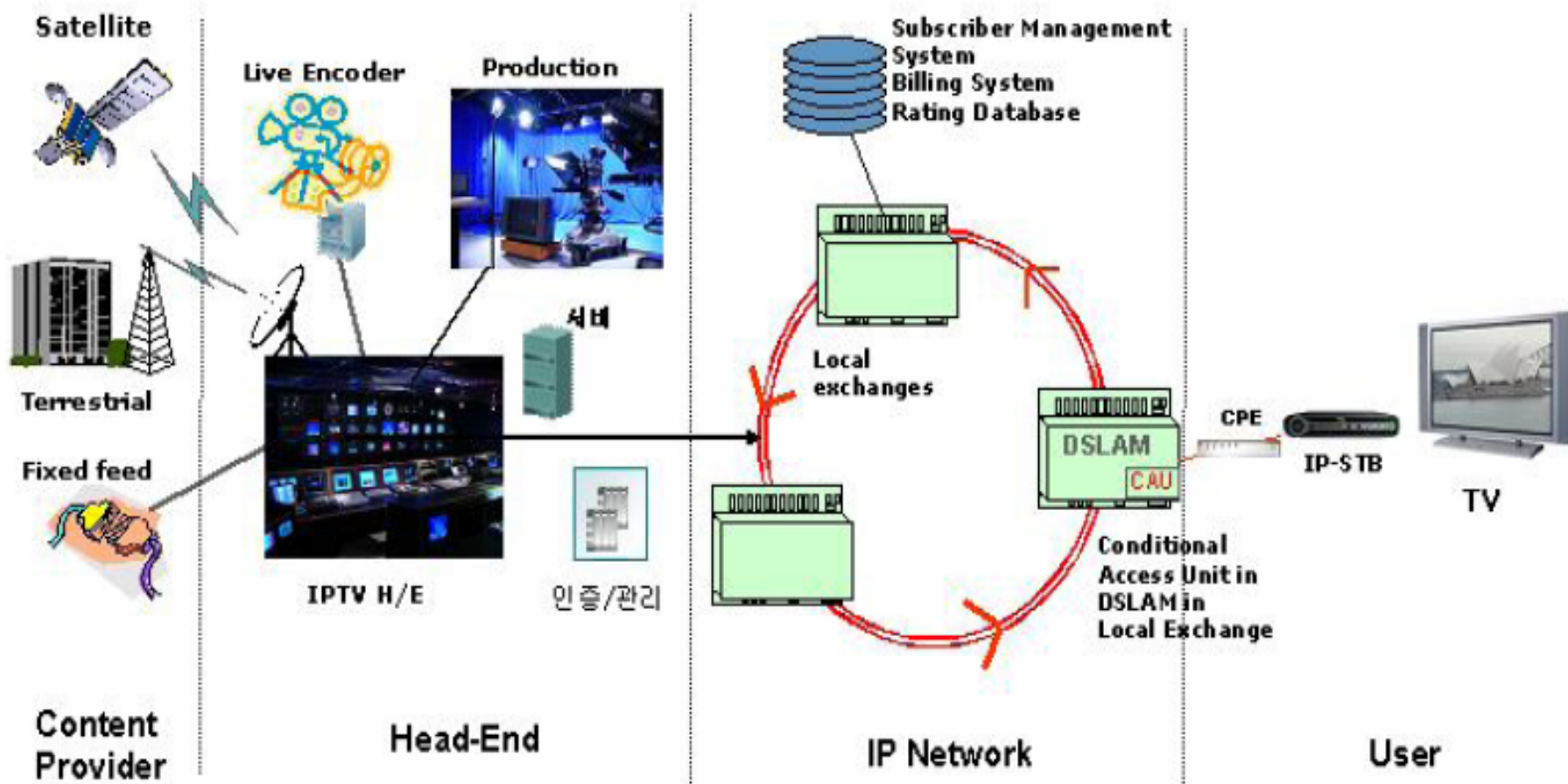
Contents의 예제

- Voice
- Sound
- Image
- Video
- Text
- Graphic
- Voice and video
- Sound and video
- Combination of these contents

- What kind of contents delivery system?
- -> 그림 도시 (인터넷 방송)

IPTV 시스템 구성 (1)

Service Management



Content Source

IPTV Service Nodes
 -> VOD server
 -> Broadcast Server

WIDE Area Distrution Network
 -> Core and Access Network
 -> Customer Access Network

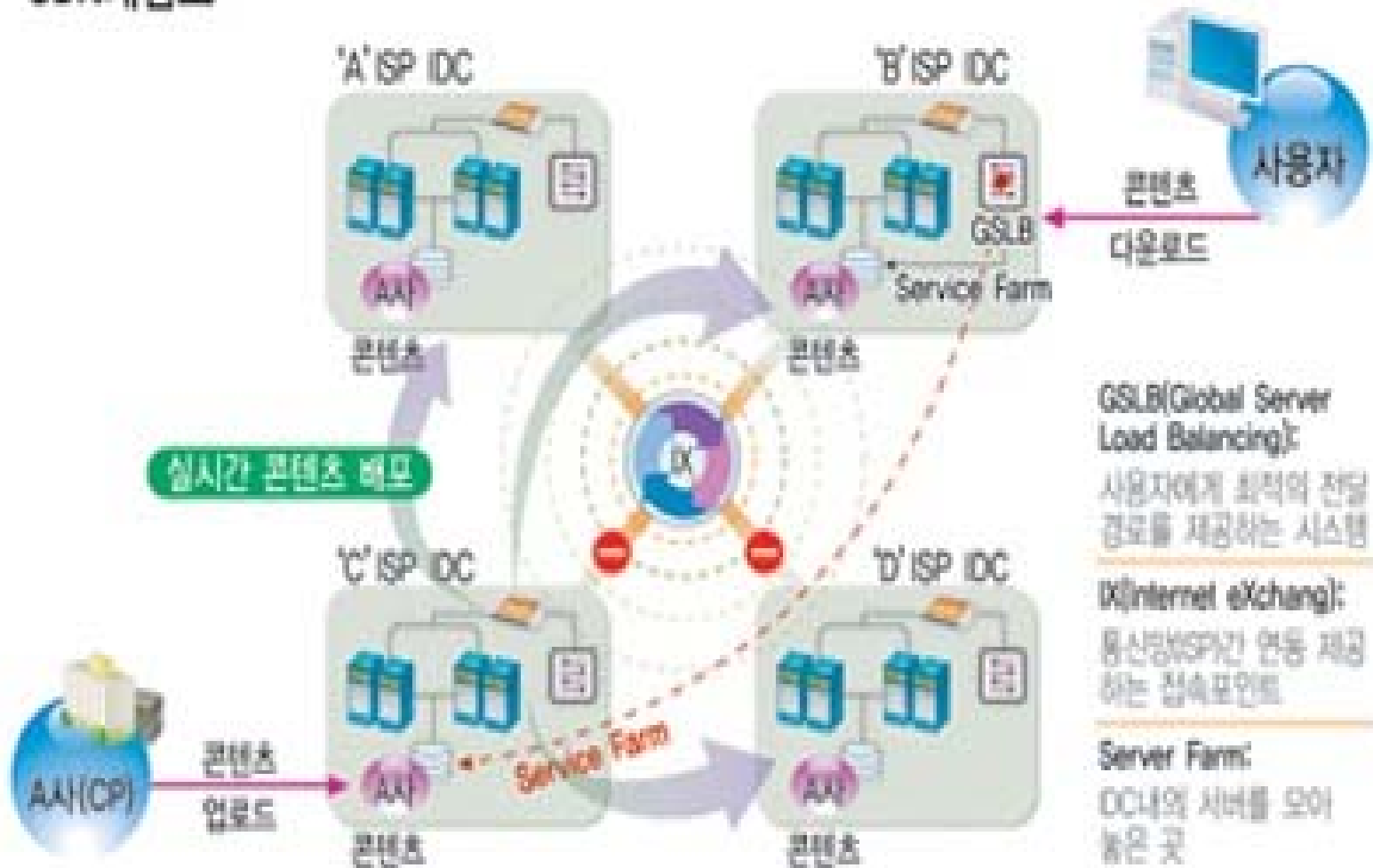
Customer Equipment
 -> Set-box & Home Network
 -> IPTV

■ 알아봅시다

CDN(콘텐츠전송네트워크)

디지털타임스 2007년 3월19일

CDN개념도



Chapter 0 Overview of DC/CN

- A sign of the increasing interconnectivity
 - Internet and World Wide Web via Computer and modem
 - Network
 - Development of the personal computer
 - Development of the communication technology
 - Development of the information processing technology
- Need to know
 - How networks operate
 - What types of technology are available
 - Which design best fills which set of needs
- History of Computer Network and Telecommunication Network

History of Computer

- Main Frame Computer
 - Terminal emulation
 - Dummy Terminal
 - X-Terminal
 - Intelligent Terminal

- Workstation
 - Disk-less workstation
 - Workstation

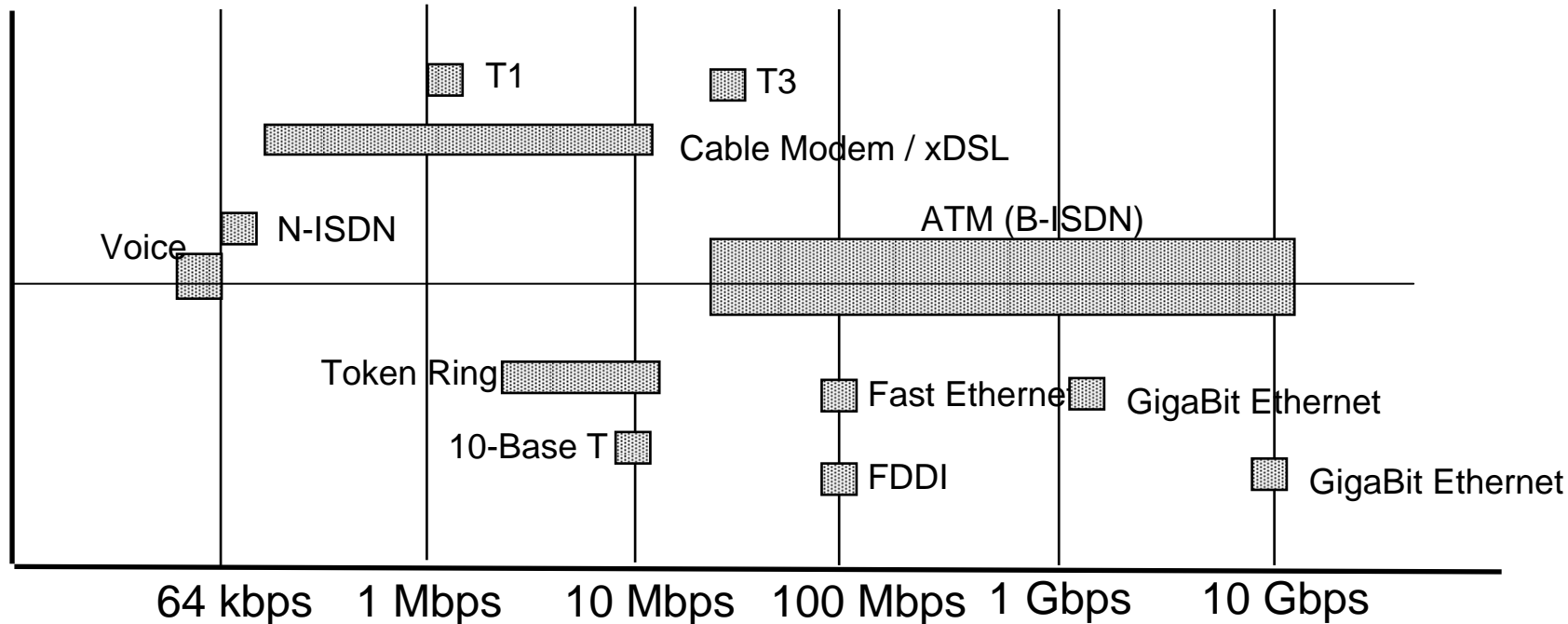
- Personal Computer

- Digital Device
 - Mobile Device: PDA, Cellular-Phone, Navigator, PMP
 - Fixed Device: Home Appliances and Digital Devices

- Key Items
 - Graphic Capability
 - Main Processor
 - Main Memory
 - Secondary Storage
 - Network Facility

History of Telecommunication

- Telecommunication Network
 - telephone services; conference calling, voice mail, video conference, and on-demand services
- Data transfer Technology (**not including Mobile Tech.**)



Network Designer

Network
Designer

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graph TD; A[Network Designer] --> B[Designing connections between Computers : PC, Workstation, or Mainframe]; B --> C[Considering the Follows]; C --> D[How does information flow?]; D --> E[Who is sharing data and what kind is being shared?]; E --> F[How much physical distance does the information have to travel?];
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Designing connections between Computers :
PC, Workstation, or Mainframe

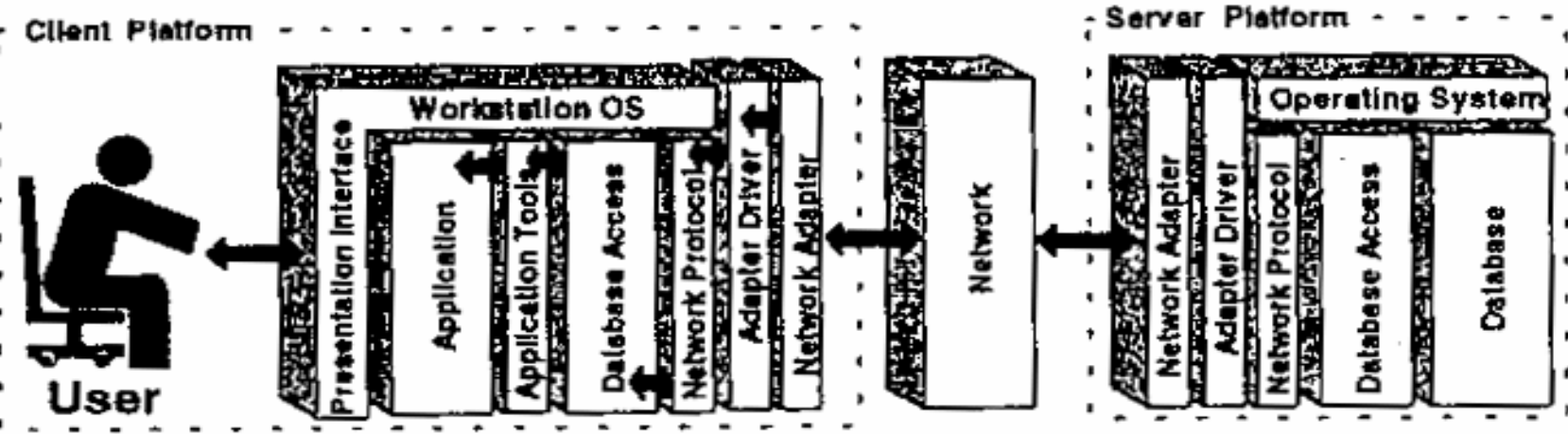
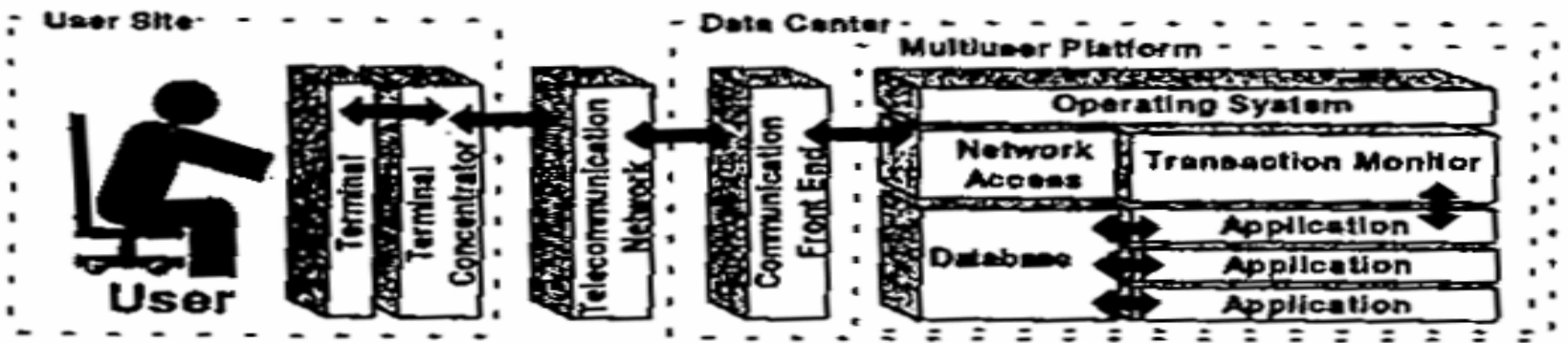
Considering the Follows

How does information flow ?

Who is sharing data and what kind is being shared?

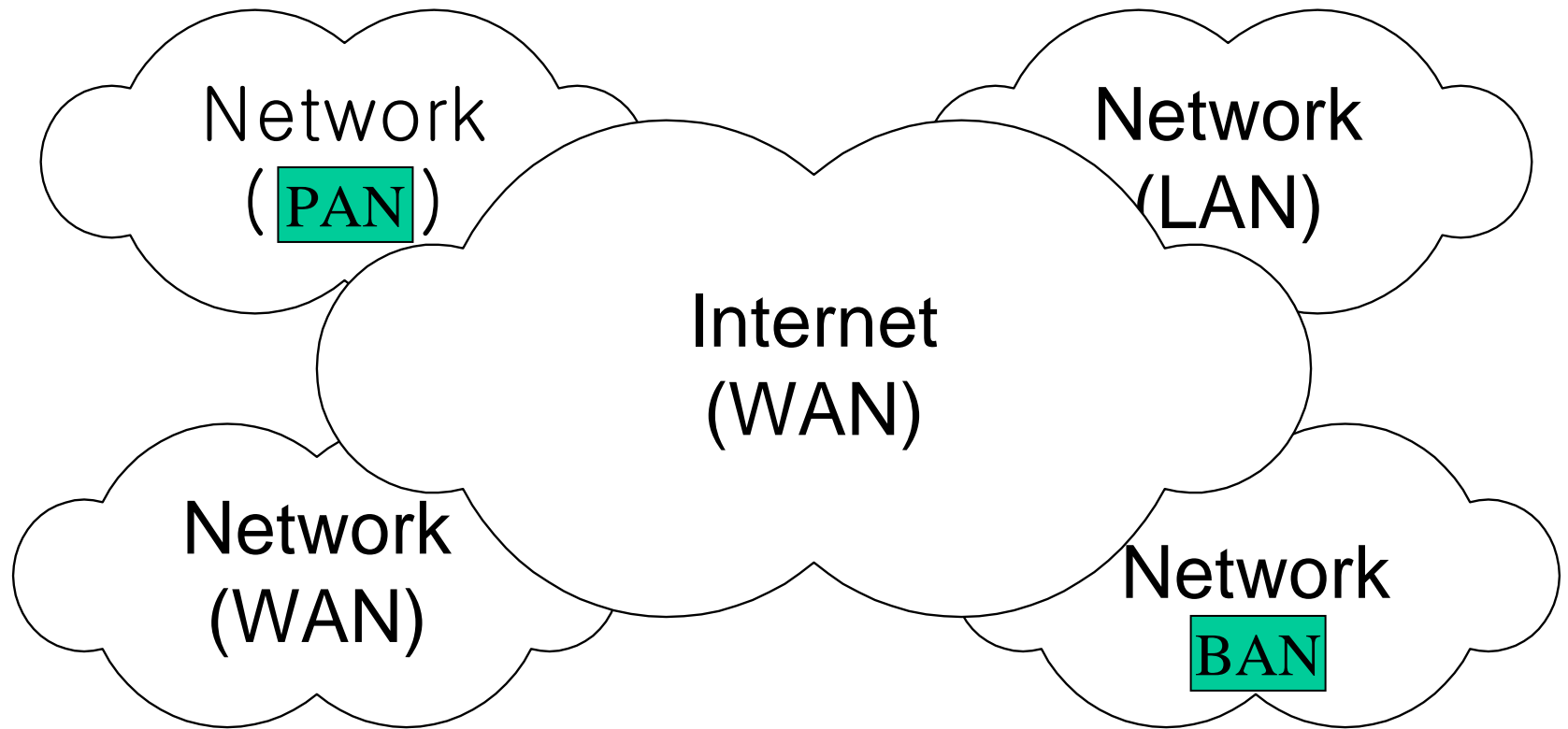
How much physical distance does the information have to travel?

Single Vs Distributed



Example of Computer network

Internet:



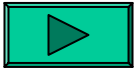
0.1 Data Communication (1)

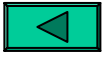
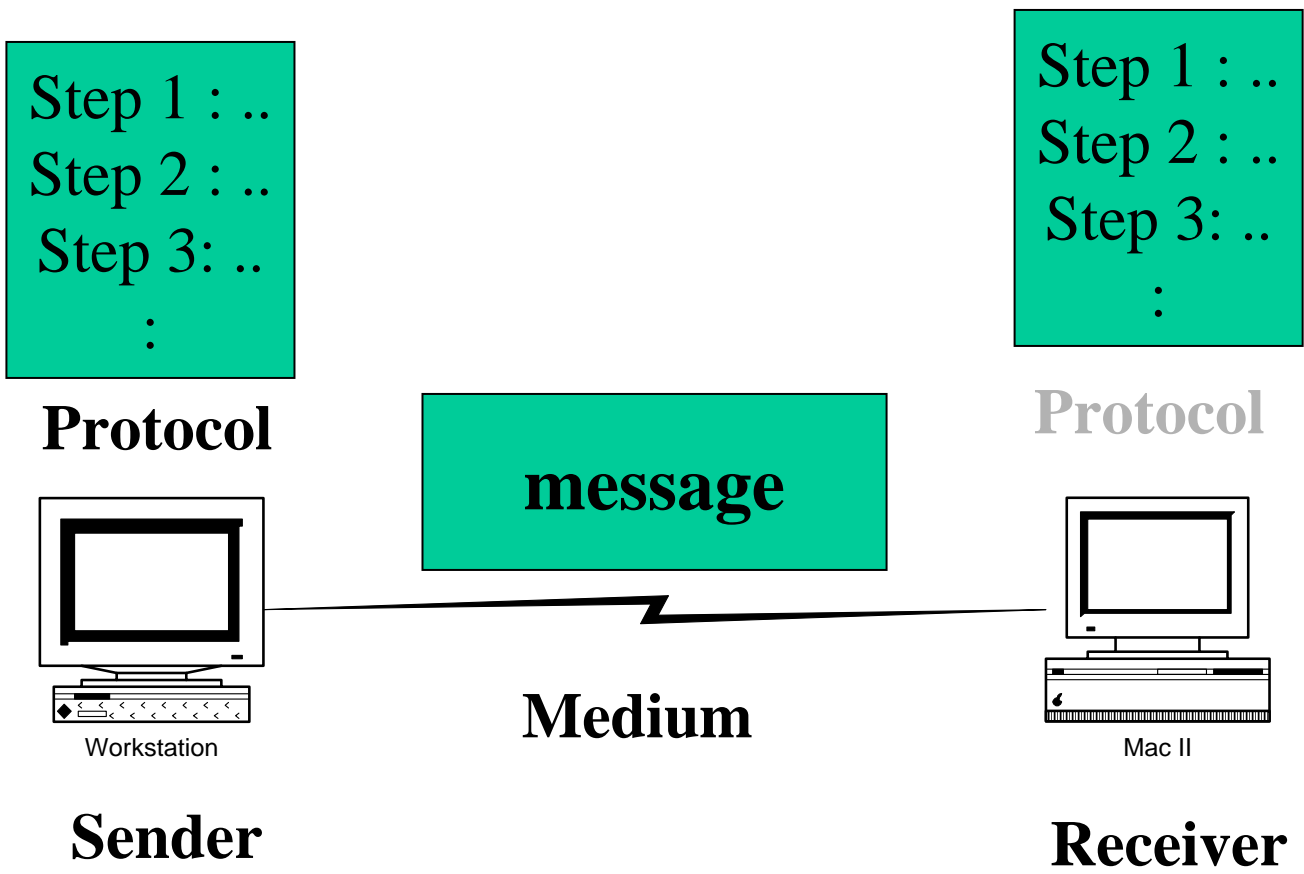
- Communication
 - is a sharing of information
 - local communication: face to face
 - remote communication: takes place over distance
 - Telecommunication
 - means communication at a distance
 - example, telephony, telegraphy, and television
- Data
 - refers to facts, concepts, and instructions
 - are represented by binary information units
- Data Communication
 - is the exchange of data between two devices via some form of transmission medium
 - Be considered both local and remote data communication

0.1 Data Communication (2)

- Effectiveness of a data communication system
 - Delivery
 - The system must deliver data to the correct destination
 - Data must be received by the intended device or user
 - Accuracy
 - The system must deliver data accurately
 - Data that have been altered in transmission and left uncorrected are unusable.
 - Timeliness
 - The system must deliver data in a timely manner
 - Data delivered late are useless

0.1 Data Communication (3)

- Components
 - Five components (see )
 - 1. Message
 - is the information (data) to be communicated
 - 2. Sender
 - is the device that sends the message
 - 3. Receiver
 - is the device that received the message
 - 4. Medium
 - is the physical path by which a message travels from sender to receiver
 - 5. Protocol
 - is a set of rules that govern data communication



0.2 Networks (1)

- Network
 - A set of devices (referred to as nodes) connected by media links
 - Node: a computer, printer, or any other device capable of sending and/or receiving data generated by other nodes on the network
 - Link: communication channels
- Client/Server 기반 Distributed Processing
 - a task is divided among multiple computers
 - History of the distributed processing
 - Intranet service
 - Internet service
 - Web service
 - Grid computing service
 - Ubiquitous Life service

0.2 Networks (2)

- Network Criteria
 - Performance
 - transit time: the amount of time required for a message to travel from one device to another
 - response time: the elapsed time between an inquiry and a response
 - Reliability
 - the accuracy of delivery
 - the measurement of frequency for failure
 - the time it takes a link to recover from a failure
 - the network's robustness in a catastrophe
 - Security
 - Protecting data from unauthorized access and viruses

0.2 Networks (3)

- Performance
 - Number of users
 - Type of transmission medium
 - Hardware
 - Software
- Reliability
 - Frequency of failure
 - Recovery time of a network after a failure
 - Catastrophe
- Security
 - Unauthorized access\
 - Viruses

0.2 Networks (4)

- Applications in U-life
 - Marketing and sales
 - Financial services
 - Manufacturing
 - Electronic messaging
 - U-city, U-health, U-town
 - Digital Library, Information system
 - Electronic Contents Management (ECM)
 - Video conferencing
 - Entertainments
 - Internet television
 - Etc.

0.3 Protocol and Standards (1)

- Protocols
 - a set of rules that govern data communication in which occurs between entities in different systems
 - An entity: is capable of sending or receiving information
 - Examples: application programs, file transfer, browsers, DBMS, and E-mail
 - A system is a physical object that contains one or more entities
 - Defines
 - What is communicated,
 - How it is communicated,
 - When it is communicated
 - Key elements: Syntax, Semantics, Timing

0.3 Protocol and Standards (2)

- Syntax
 - Refers to the structure or format of the data, meaning the order in which they are presented
 - Example of a simple protocol
 - the first eight bits of data is the address of the sender
 - the second 8 bits is the address of the receiver
 - the rest of the bit stream is the message itself
- Semantics
 - Refers to the meaning of each section of bits
 - How is a particular pattern to be interpreted?
 - What action is to be taken based on that interpretation?
 - Example: an address identifies the route to be taken or the destination
- Timing
 - Refers to When data should be sent and How fast it can be sent
 - Example: If sending data at 100Mbps and receiving at only 1Mbps
 - » the transmission will be largely lost

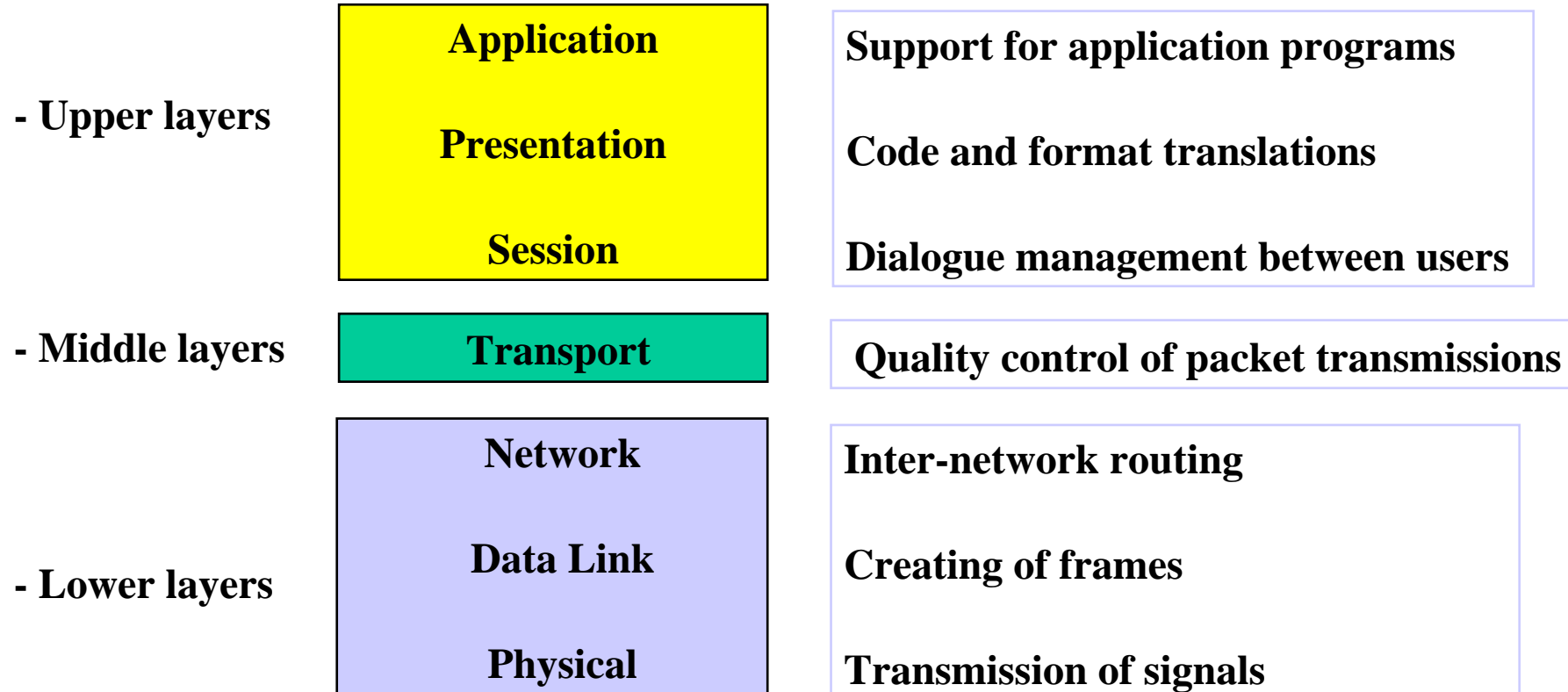
0.3 Protocol and Standards (3)

- Standards
 - Provides a model for development that makes it possible for a product to work regardless of the individual manufacturer
 - Guarantees national and international interoperability of data and telecommunication technology and processes
 - Provides guidelines to manufacturers., venders, government agencies, and other service providers to ensure the kind of interconnectivity
 - Two categories
 - de jure (by law)
 - de facto (by fact)
 - proprietary: be invented by a commercial organization
 - » closed standards
 - non-proprietary: be developed by groups or committees
 - » open standards

Computer Network Protocol

OSI Model

- Defined by ISO (International Standard Organization)
- 7 Layer Architecture



0.4 Standards Organizations

- Developed by Committees, Forums, Government regulatory agencies
- Standards Creation Committees
 - The International Standards Organization (ISO)
 - The International Telecommunication Union (ITU-T)
 - The American National Standards Institute (ANSI)
 - The Institute of Electrical and Electronics Engineers (IEEE)
 - The Electronic Institute Association (EIA)
 - Bellcore
- Forum
 - Frame Relay Forum
 - ATM Forum and ATM Consortium
 - Internet Society and Internet Engineering Task Force
- Regulatory Agencies
 - Federal Communication Commission (FCC)