

DEVELOPING EDUCATIONAL NETWORK & LINKAGES

1. Important dates in the history of data communications

<u>Year</u>	<u>Event</u>
1837	• Invention of the telegraph
1876	• Invention of telephone
1947	• Invention of transistor (replace vacuum tube)
1948	• First commercial computer installed, the UNIVAC I
1958	• First U.S. Communication satellite sent into orbit
1959	• FCC approves private microwave communications networks
1964	• Packet switching network concept proposed by the Rand Corporation
1966	• IBM's binary synchronous (BISYNC or BSC) protocol announced
1969	• ARPANET, first packet switching network (later to become the internet), begin operation
	• Ethernet local area network specifications formulated
1972	• IBM's Synchronous Data Link Control (SDLC) protocol announced
1974	• IBM announces its System Network Architecture (SNA)
1975	• Personal computers introduced, the Altair 8800 replaced terminal in many cases
1981	• IBM PC introduced
1985	• Cellular radio telephone are introduced
1990	• World Wide Web is introduced
1993	• Web search engines introduced
1995	• The internet grows to over 4 millions host computers
1999	• The internet grows to over 10 millions host computers

2. What is computer network?

- Two or more computers or communications devices connected by transmission media and channels and guided by a set of rules for communication purposes that allow users to communicate with each other and share applications and data
- Component of a computer network
 - Hardware
 - Computer
 - Network card
 - Routers
 - Modem
 - Media
 - Cable
 - Wire
 - Microwave
 - Software
 - Network OS
 - Utilities
 - Network design
 - Logical layout
 - Physical layout

3. Applications of a Computer Network

- Mass transit
- Interstate highway
- 24-hours bankers, grocery store
- Cable television
- Pagers
- Mobile telephones
- Most businesses and schools
- Retail outlets and etc...

4. Network Essentials

- Network OS
 - Models
 - Clients/server
 - Peer-to-peer
 - Types
 - Local Area Network (LAN)
 - Metropolitan Area Network (MAN)
 - Wide Area Network (WAN)
 - Topologies
 - Bus topology
 - Ring topology
 - Star topology
 - Technologies
 - Ethernet
 - Token ring
 - Transmission Control Protocol/Internet Protocol (TCP/IP)
 - Wireless Application Protocol (WAP)

5. Network Technologies

- Ethernet
 - Based on bus topology but can be used in star topology
 - Higher speed – first Fast Ethernet, then Gigabit Ethernet
 - Most popular – inexpensive, easy to install and maintain
- Token Ring
 - Based on ring topology but can use a star topology
 - Token-passing scheme to prevent collision of data
 - The second most widely used protocol after Ethernet
- TCP/IP
 - Based on client/server model of network computing
 - Uses packet switching technique for data transmission

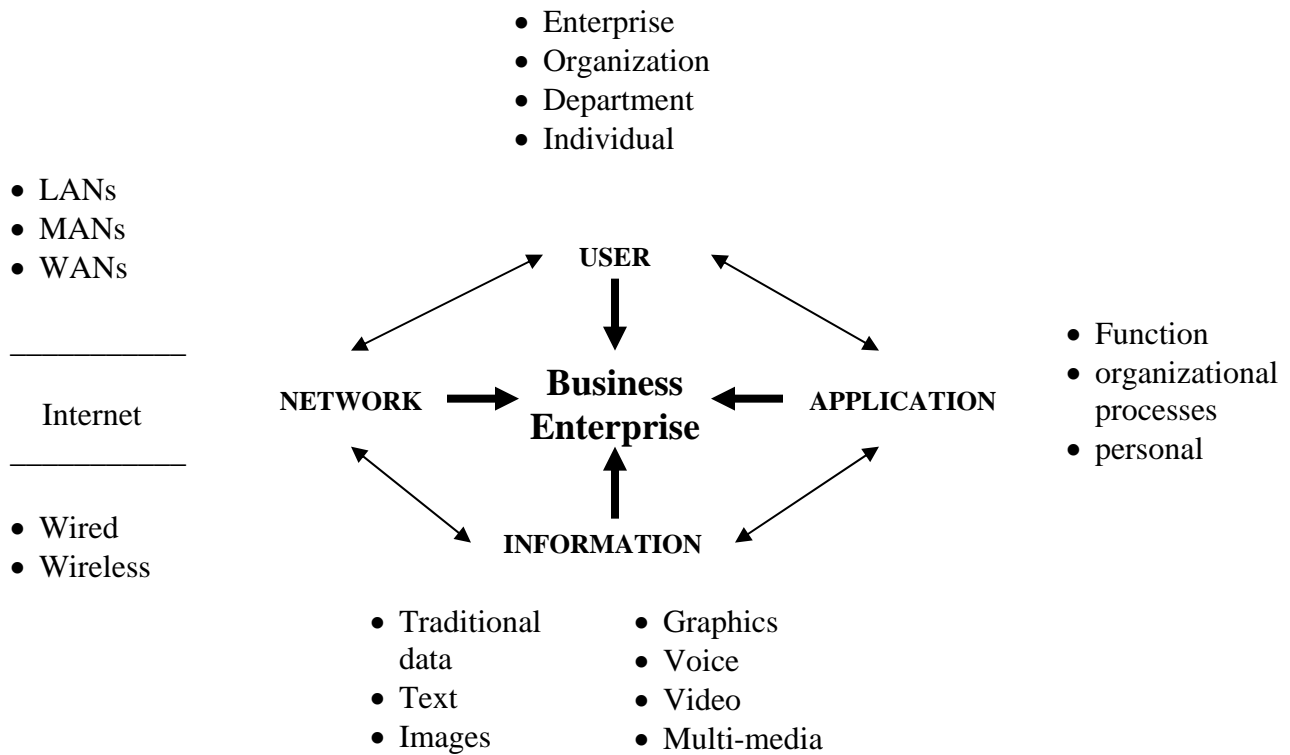
- Commonly use for internet application
- WAP
 - Uses client/server model of network computing
 - Allow wireless devices to access the internet and www
 - Meets increasing demands for wireless internet access

6. The world of connectivity

- Wired or wireless communications links offer several option for information and communication
 - Telephone related services
 - Fax messages
 - Voice mail
 - Video/voice communication
 - Video conferencing
 - Picture phone
 - Online information services
 - Research and news
 - Email
 - BBSs
 - Chat
 - Games
 - Entertainment
 - Travel services
 - Shopping etc...
 - The internet
 - Email
 - Usenet news
 - Groups
 - Mailing lists
 - FTP
 - Telenet

- Gopher space
- World Wide Web
- Services offer by online information service
- Shared resources
 - Workgroup computing
 - Electronic data interchange
 - Intranet and extranet

7. Why are network important?



8. Networks: Pros and Cons

Pros

- Resources sharing
 - Printers, CD-ROMs, computer
- Data and information sharing
- Communications
- Reduced cost
- On-line service
- Groupware
 - Software that supports group efforts over a network
- Electronic data interchange

Cons

- Security risks increase with network
- Complexity is associated with networks
- Investment is high and return on it may not happen

9. Key issues of Networks

- Access to the internet
- Network access
 - Wired access
 - Cable modem
 - DSL
 - Wireless access
 - Wireless LAN
 - RosettaNet – XML based
- Network security
 - Goals and measures
 - Firewalls

10. Networking Essentials

- Computer Networks
 - A host computer connected with communication circuits and equipment to terminals
 - Two or more computers connected via a communication medium
- Intranet
 - A private version of the internet
- Enterprise Network
 - Two or more LANs connected to each other, or one or more LANs connected to a WAN
- File server
 - A computer that contains files shared by PCs on a network

11. Categorization of Networks

- By size
 - Wide Area Network (WAN)
 - Metropolitan Area Network (MAN)
 - Local Area Network (LAN)
- By capability
 - Client/ server
 - Peer-to-peer

12. Three major types of networks

- Local Area Network (LAN)
 - Serves users within a confined geographically area (usually within a mile)
- Metropolitan Area Network (MAN)
 - Covers a geographic area the size of a city or suburb. The purpose of a MAN is often to bypass local telephone companies when accessing long-distance service
- Wide Area Network (WAN)

- Covers a wide geographical area, such as a state or a country. E.g. Tymnet, Telenet, Uninet and Accunet.

13. Networking and Telecommunications

- Networking – an interconnection of computers and computing equipment using either wires or radio waves over small or large geographic distances
- Telecommunications – study of telephones and the systems that transmit telephone signals
- Network management – design, installation, and support of a network and its hardware and software