

Management Information System



St. Clements University
MBA Program
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Hong Kong

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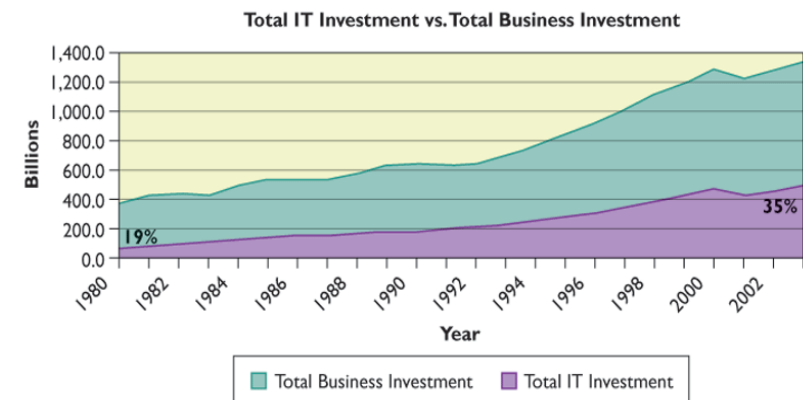
1. The role of information systems

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Rise of the Information Economy

The growth of the information economy



Source: Based on data in U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts, Tables 5.2 and 5.8, 2003.

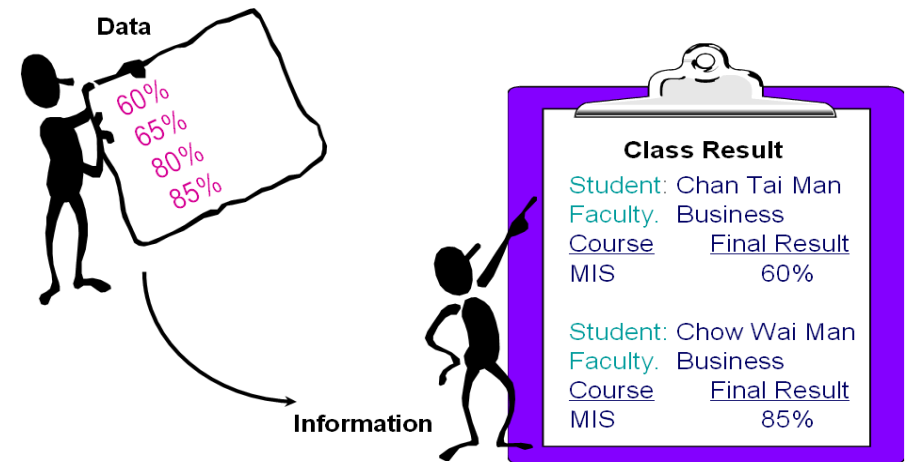
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What Is an Information System?

- A set of interrelated components that **collect** (or retrieve), **process**, **store**, and **distribute information** to **support decision making** and **control** in an organization.
- What is the difference between **information** and **data**?
 - **Data:** Streams of raw facts representing events such as business transactions.
 - **Information:** Clusters of data that are meaningful and useful to human beings in the processes such as making decisions.

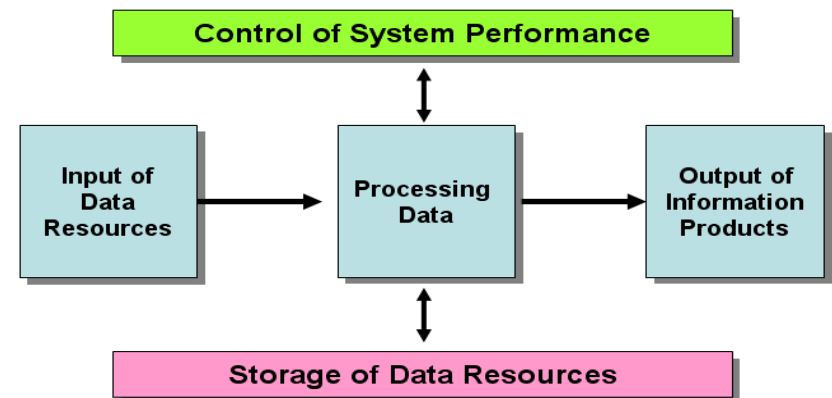
Data and Information



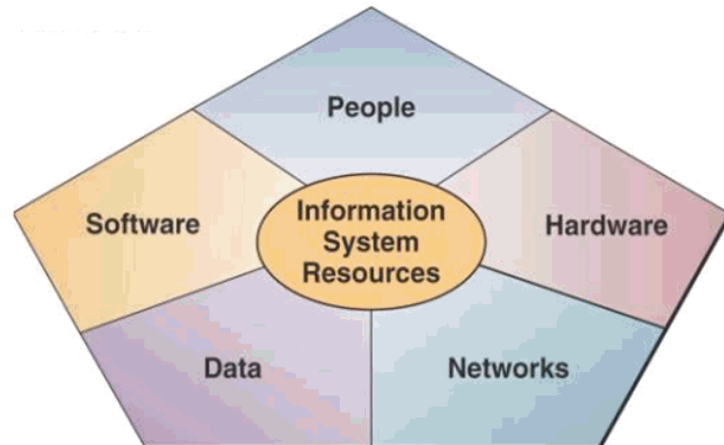
Information Technology (IT) & Information System (IS)

- IT
 - Application of technological knowledge for generating, manipulating & communicating information
 - Refers to technical aspect of an information system
- IS
 - Manual / computer-based
 - Assuming all IS are computer-based in this course
- Use computer hardware and software to process and disseminate information

What is Computer-based Information Systems?



Components of Information Systems



The Challenges of Information Systems: Key Management issues - 1

Positive Impacts of Information Systems

- Faster calculations and paperwork
- Analysis of customer purchase patterns and preferences
- More efficient business services
- Instant global distribution of information

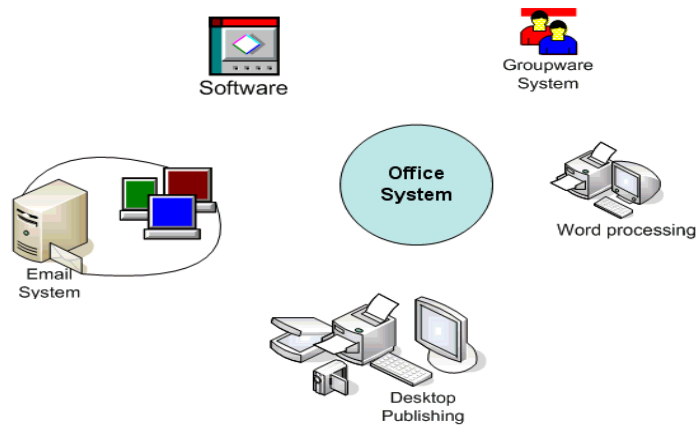
The Challenges of Information Systems: Key Management issues - 2

Negative Impacts of Information Systems

- Automation leading to job elimination
- Privacy concerns
- System outages and shutdowns
- Health problems, repetitive stress injury
- Illegal distribution of intellectual property

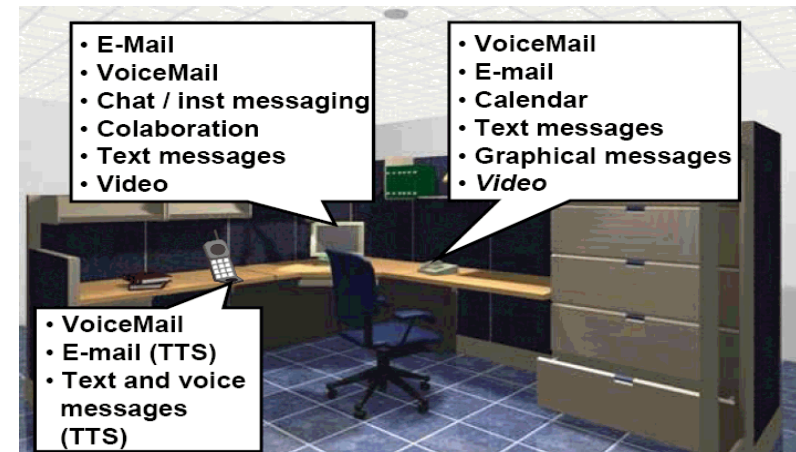
2. Hardware and Software in the Enterprise

Common Compartments in an Office System



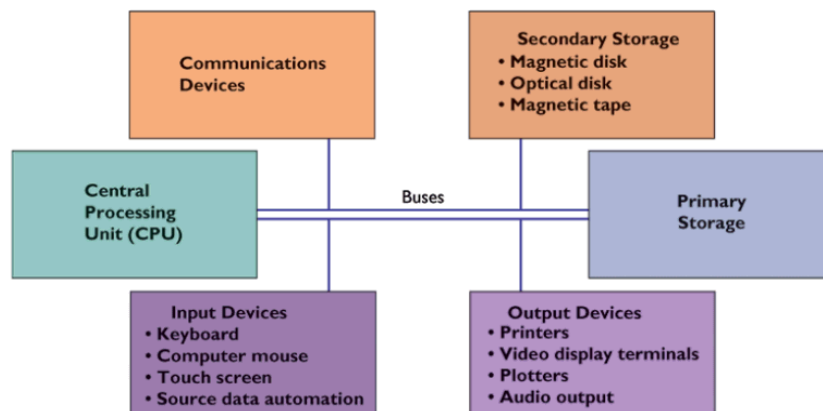
Example of today's work environment

- Three communication devices: **PC**, **desk phone**, **mobile**



Computer Hardware and Information Technology Infrastructure - 1

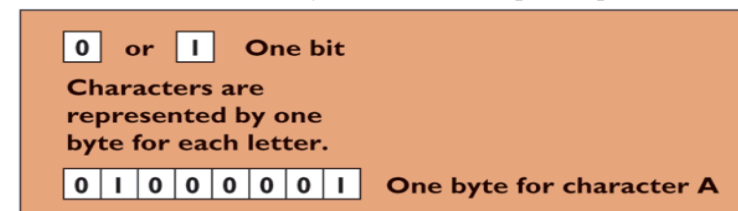
- Hardware components of a computer system



Computer Hardware and Information Technology Infrastructure - 2

The Computer System

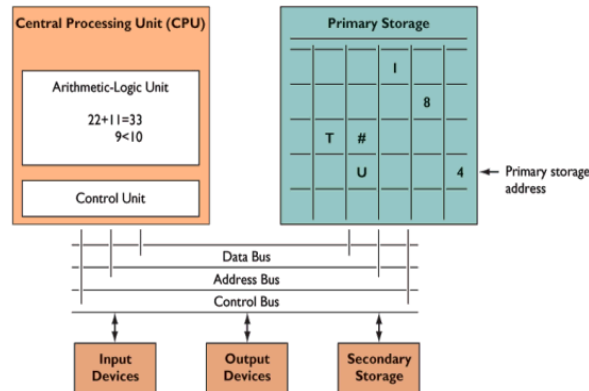
- Bit**
 - Binary digit
 - Represents 0 or 1
- Byte**
 - String of eight bits
 - Stores one number, symbol, character, part of picture



Computer Hardware and Information Technology Infrastructure - 3

The Computer System

- **The Central Processing Unit (CPU)**
 - Controls other parts of computer
- **Arithmetic-logic unit**
 - Performs principle logical/mathematical operations
- **Control unit**
 - Coordinates other parts, such as reading a stored program



Computer Hardware and Information Technology Infrastructure - 4

The Computer System

- **Primary Storage**
 - Located near CPU
 - Stores all or part of active software program
 - Stores data the program is using
 - Composed of semi-conductors
 - RAM (random access memory): Used for short-term, temporary storage
 - ROM (read-only memory): Semiconductor memory chips with program instructions

Computer Hardware and Information Technology Infrastructure - 5

The Computer System

- **Secondary Storage Technology**
 - Used for relatively long-term storage of data outside CPU
 - Magnetic disk: floppies, hard disks, RAID
 - Flash memory
 - Optical disk: CD-ROM, CD-RW, DVD
 - Magnetic tape
 - Storage networking: direct-attached storage; network-attached storage; storage area networks

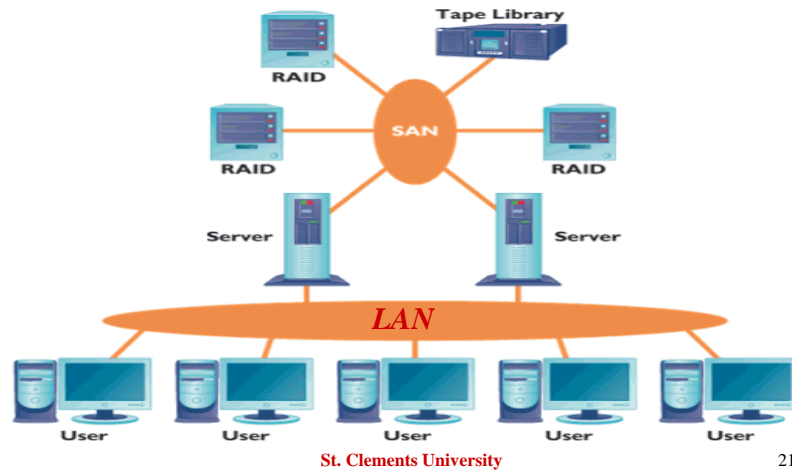
Computer Hardware and Information Technology Infrastructure - 6

Hierarchy of Memory Capacity

- Kilobyte (KB): approximately one thousand bytes.
- Megabyte (MB): approximately one million bytes (1,048,576 bytes, or $1,024 \times 1,024$).
- Gigabyte (GB): actually 1,073,741,824 bytes ($1,024 \times 1,024 \times 1,024$ bytes).
- Terabyte: One trillion bytes, 10^{12} bytes.
- Petabyte: Approximately 10^{15} bytes.
- Exabyte: Approximately 10^{18} bytes.

Computer Hardware and Information Technology Infrastructure - 7

A storage area network (SAN)



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Computer Hardware and Information Technology Infrastructure - 8

The Computer System

• Input Devices

- Keyboard and mouse
- Touch screen
- Optical character recognition
- Magnetic ink character recognition (MICR)

1234567890123456789012345678901234567890

- Pen-based input
- Digital scanner
- Audio input
- Radio-frequency identification (RFID)

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Computer Hardware and Information Technology Infrastructure - 9

The Computer System

• Output Devices

- Cathode-ray tube (CRT)
- LCD Panel
- Printers
- Audio output

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Classifying Computers

- **Mainframe:** Largest computer, largest multi-user systems, handles massive amounts of data; used for large business, scientific, military applications.



- **Workstation:** More powerful desktop computer used for computation-intensive tasks. A midrange systems multi-user system.
- **Personal computer:** Portable or desktop microcomputer. A single user system.

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Types of Software

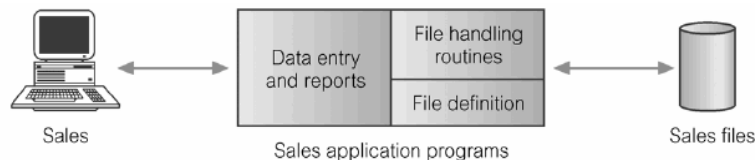
- **Software program:** A series of statements or instructions to the computer
- Two major types of software:
 - **System software**
 - Generalized programs that manage the computer's resources
 - For example, the Windows family of Operating Systems
 - **Application software**
 - Programs written for or by users to perform a specific task.
 - For example, Word, Excel, Powerpoint

3. Database Management Systems

File Systems - 1

Traditional file environment:

- Each application program defines and manages its own data.



- Each program defines and manages its own data.



File Systems - 2

Limitations of File-based Approach:

1. Separation and isolation of data

- Each program maintains its own set of data.
- Users of one program may be unaware of potentially useful data held by other programs.

2. Duplication of data

- Same data is held by different programs.
- Wasted space and potentially different values and/or different formats for the same item.

File Systems - 3

3. Data dependence

- File structure is defined in the program code.

4. Incompatible file formats

- Programs are written in different languages, and so cannot easily access each others files.

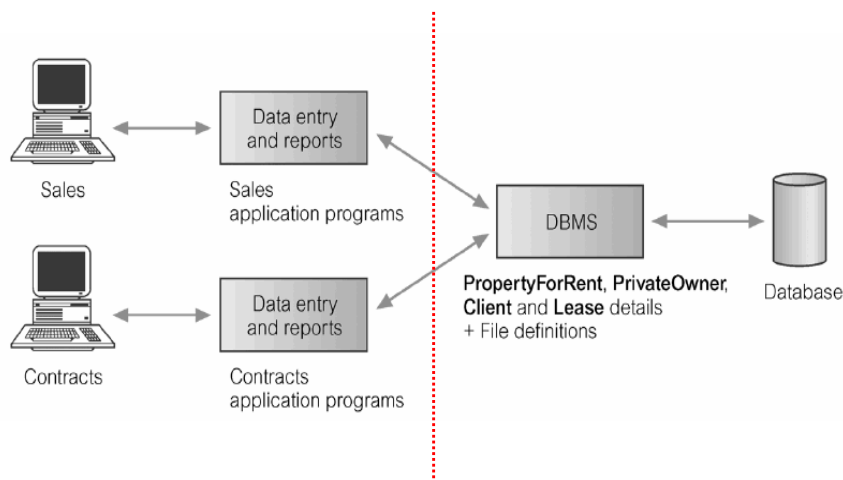
5. Fixed Queries/Proliferation of application programs

- Programs are written to satisfy particular functions.
- Any new requirement needs a new program.

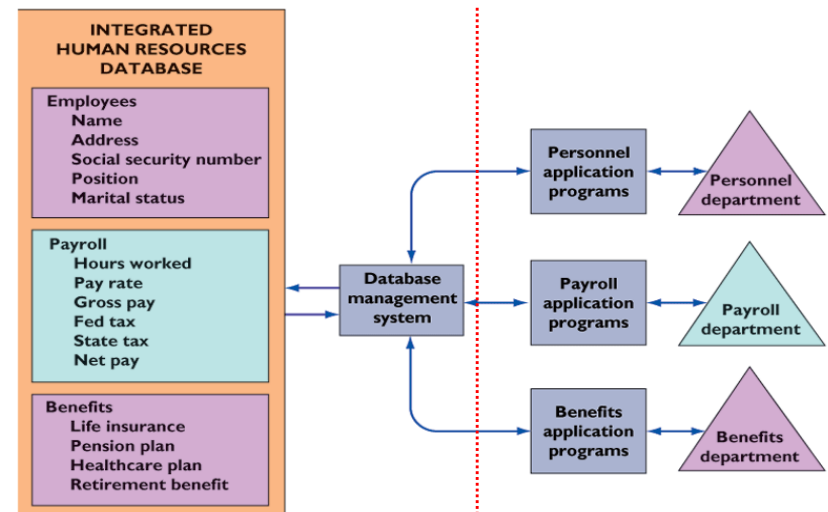
The Database Approach to Data Management - 1

- Shared collection of logically related data (and a description of this data), designed to meet the information needs of an organization.
- System catalog (metadata) provides description of data to enable program–data independence.
- Logically related data comprises entities, attributes, and relationships of an organization's information.

The Database Approach to Data Management - 2



The Database Approach to Data Management - 3



DBMS Approach

Database Management System (DBMS)

- A software system that enables users to **define**, **create**, and **maintain** the database and which **provides controlled access to this database**.

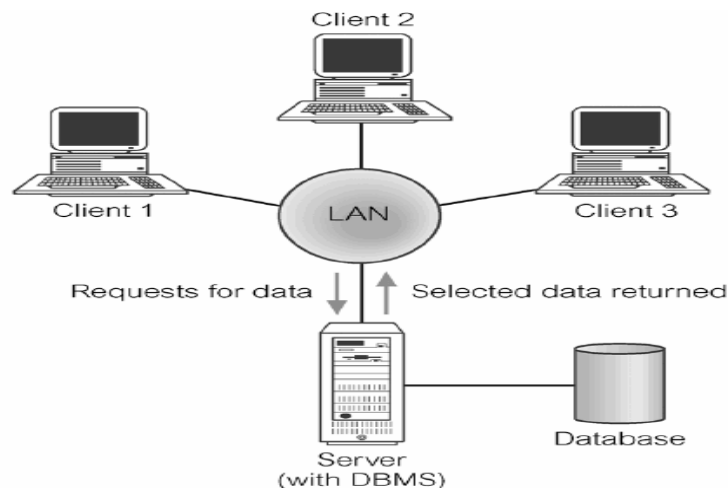
DBMS Components

1. **Data definition language**: Formal language for specifying the **structure of database**
2. **Data manipulation language**: For **extracting data from database**, e.g. SQL.

How a DBMS Solves Problems of a Traditional File Environment

- Reduces data redundancy
- Eliminates data inconsistency
- Uncouples programs from data
- Increases access and availability of data
- Allows central management of data, data use, and security

Database Client-server Architecture



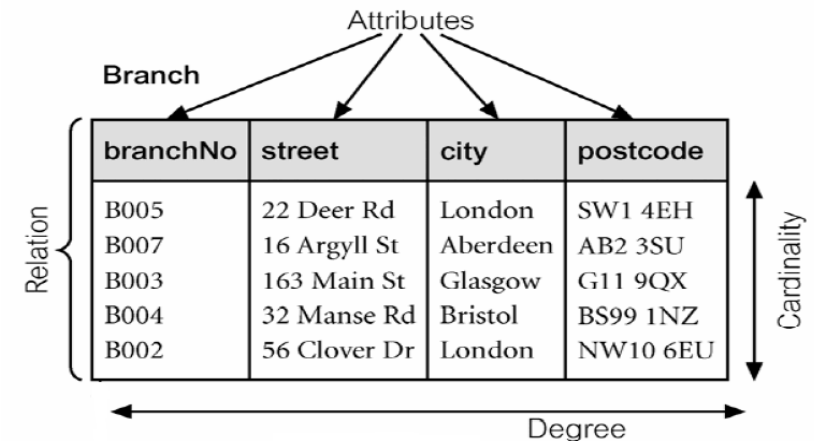
Disadvantages of DBMS

- Complexity
- Size
- Cost of DBMS
- Additional hardware costs
- Cost of conversion
- Performance
- Higher impact of a failure

Relational DBMS - 1

- A **relation** is a table with columns and rows.
 - **Attribute** is a named column of a relation.
 - **Domain** is the set of allowable values for one or more attributes.
 - **Tuple** is a row of a relation.
 - **Degree** is the number of attributes in a relation.
 - **Cardinality** is the number of tuples in a relation.
- Relational Database is a collection of normalized relations with distinct relation names.

Relational DBMS - 2



- Relates data across tables based on **common data element**.

Relational DBMS - 3

Table (Relation)				
Columns (Attributes, Fields)				
ORDER	Order_ Number	Order_ Date	Delivery_ Date	Part_ Number
	1634	02/02/04	02/22/04	152
	1635	02/12/04	02/28/04	137
	1636	02/13/04	03/01/04	145
PART	Part_ Number	Part_ Description	Unit_ Price	Supplier_ Number
	137	Door latch	22.50	4058
	145	Door handle	26.25	2038
	150	Door seal	6.00	4058
	152	Compressor	70.00	1125
SUPPLIER	Supplier_ Number	Supplier_ Name	Supplier_ Address	
	4058	CBM Inc.	44 Winslow, Gary, IN 44950	
	2038	Ace Inc.	Rte. 101, Essex, NJ 07763	
	1125	Bryant Corp.	51 Elm, Rochester, NY 11349	

Relational DBMS - 4

Alternative terminology for relational model terms

Formal terms	Alternative 1	Alternative 2
Relation	Table	File
Tuple	Row	Record
Attribute	Column	Field

Relational DBMS - 5

Basic Operations in a Relational Database:

- **Select:** Creates **subset of rows** that meet specific criteria

Original table			New table or list		
P_CODE	P_DESCRIPTION	PRICE	P_CODE	P_DESCRIPTION	PRICE
123456	Flashlight	5.26	123456	Flashlight	5.26
123457	Lamp	25.15	123457	Lamp	25.15
123458	Box Fan	10.99	123458	Box Fan	10.99
213345	9v battery	1.92	213345	9v battery	1.92
254467	100W bulb	1.47	254467	100W bulb	1.47
311452	Powerdrill	34.99	311452	Powerdrill	34.99

SELECT ALL will yield

123456	Flashlight	5.26
123457	Lamp	25.15
123458	Box Fan	10.99
213345	9v battery	1.92
254467	100W bulb	1.47
311452	Powerdrill	34.99

SELECT only PRICE less than 2.00 will yield

213345	9v battery	1.92
254467	100W bulb	1.47

SELECT only P_CODE=311452 will yield

311452	Powerdrill	34.99
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Relational DBMS - 6

- **Project:** Yields all values for selected attributes – **vertical subset** of a table.

Original table			New table or list	
P_CODE	P_DESCRIPTION	PRICE		
123456	Flashlight	5.26		
123457	Lamp	25.15		
123458	Box Fan	10.99		
213345	9v battery	1.92		
254467	100W bulb	1.47		
311452	Powerdrill	34.99		

PROJECT PRICE yields

5.26
25.15
10.99
1.92
1.47
34.99

PROJECT P_DESCRIPTION and PRICE yields

Flashlight	5.26
Lamp	25.15
Box Fan	10.99
9v battery	1.92
100W bulb	1.47
Powerdrill	34.99

PROJECT P_CODE and PRICE yields

123456	5.26
123457	25.15
123458	10.99
213345	1.92
254467	1.47
311452	34.99

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Relational DBMS - 7

- **Join:** Enables users to create a new table containing only relevant information from **more than one table**.

Table name: CUSTOMER				Table name: AGENT	
CUS_CODE	CUS_LNAME	CUS_ZIP	AGENT_CODE	AGENT_CODE	AGENT_PHONE
132445	vWalker	32145	231	125	6152439887
1217782	Adares	32145	125	167	6153426778
1312243	Rakowski	34129	167	231	6152431124
1321242	Rodriguez	37134	125	333	9041234445
1542311	Smithson	37134	421		
1657399	Vanloo	32145	231		

132445	vWalker	32145	231	6152439887
1217782	Adares	32145	125	6152439887
1312243	Rakowski	34129	167	6153426778
1132445	vWalker	32145	231	6152431124
1657399	Vanloo	32145	231	6152431124

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4. Business Telecommunications System

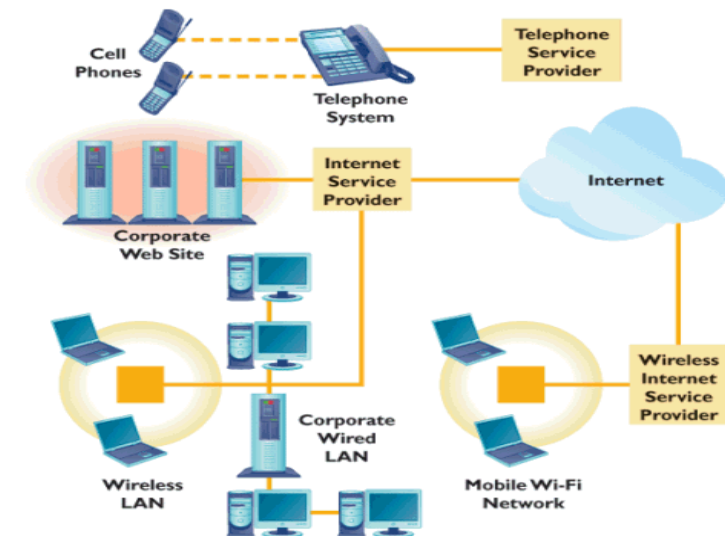
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Telecommunications System

- Facilitation of electronic communication
- Telephone systems
- Broadcast and cable TV
- Radio, satellite, and local area networks
- Internet
- Analog or digital

Corporate Telecommunications System



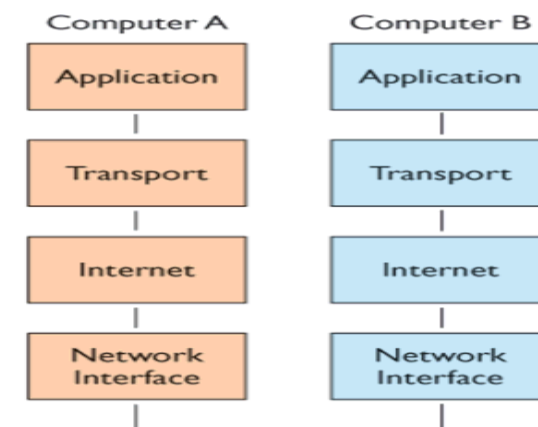
Features of Contemporary Telecommunications Systems - 1

Transmission Control Protocol/Internet Protocol (TCP/IP)

- Open suite of protocols for connectivity developed in 1970s
- Provides standards for **breaking messages into packets**, **routing them** to destination addresses, and **reassembling** them at end
- Allows for communication regardless of hardware/software

Features of Contemporary Telecommunications Systems - 2

TCP/IP: Four-Layer Reference Model



Features of Contemporary Telecommunications Systems – 3

TCP/IP: Four-Layer Reference Model

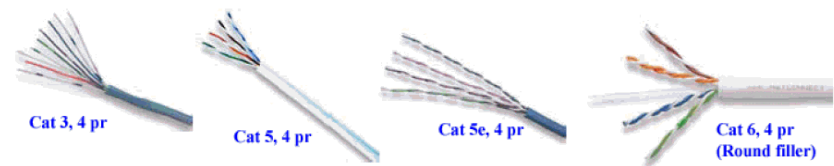
- **Application layer:** Communication between applications and other layers
- **Transport layer:** Acknowledging and sequencing packets to/from application
- **Internet layer:** Addressing, routing, packaging data packets
- **Network interface layer:** Placing packets on and receiving them from network medium

Features of Contemporary Telecommunications Systems – 4

Transmission Media - 1

Twisted wire

- Copper wire twisted in pairs
- Older analog transmission medium
- Can be used for digital signals
- Modems used for translating analog to digital

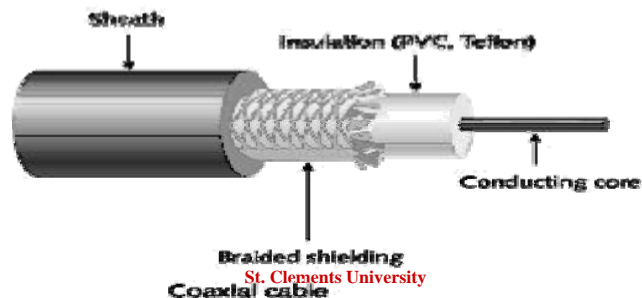


Features of Contemporary Telecommunications Systems – 5

Transmission Media - 2

Coaxial cable:

- Insulated copper wire
- Faster, more **interference-free** than twisted pair
- Difficult to install

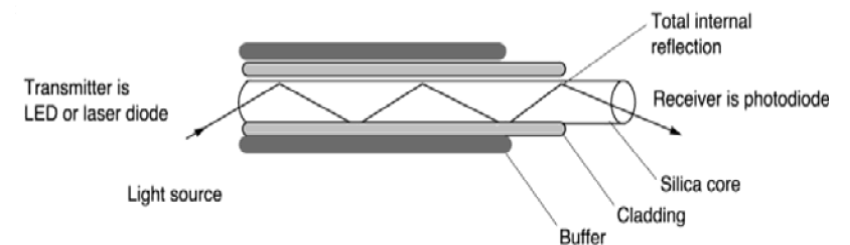


Features of Contemporary Telecommunications Systems – 6

Transmission Media – 3

• Fiber optics

- Transmission of data as light pulses through optical fiber
- First converting electronic binary signals to light, and then convert the light signals back to electronic signals at the receiving end.
- Faster, lighter, more durable



Features of Contemporary Telecommunications Systems – 7

Transmission Media – 4

- Fiber-optic technology has revolutionized telecommunications due to the **very high speed** of data transmission it can support.
- 0.1kg of optical fiber carries the same information as 30,000kg of copper cable
- At 2.5 Gbps, it is
 - equivalent to more than 3 hrs of TV per second
 - 24,000 simultaneous phone calls

Features of Contemporary Telecommunications Systems – 8

Transmission Media - 5

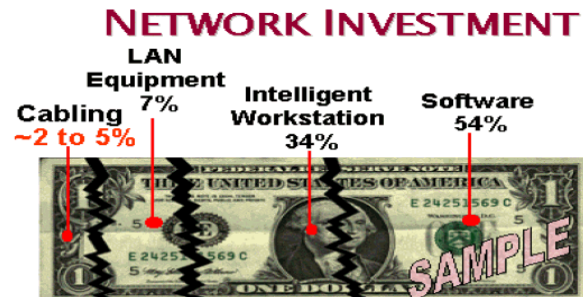
CABLING LIFE CYCLE



Features of Contemporary Telecommunications Systems – 9

Transmission Media – 6

- Although cabling represents only 2 to 5% of the total network investment, the **cabling systems will outlive most network components.**



Features of Contemporary Telecommunications Systems – 10

Transmission Media – 7

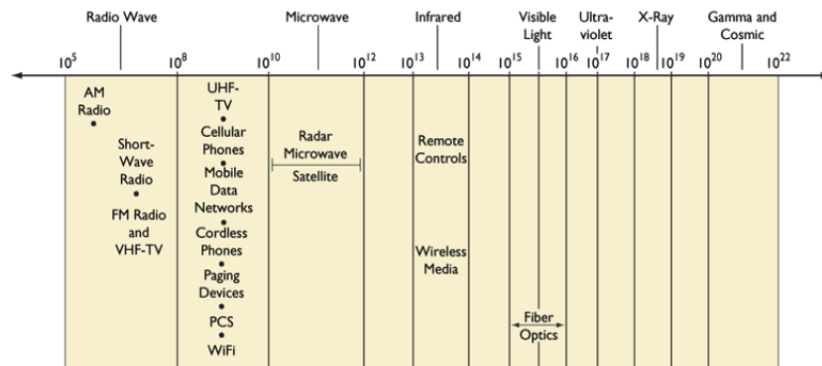
Wireless Transmission

- Use electromagnetic spectrum
- Microwave and infrared use high-frequency radio signals
- Paging systems, cellular telephones, PDAs, mobile data networks
- Wireless communication requires compatible standards
- Security/privacy issues

Features of Contemporary Telecommunications Systems – 11

Transmission Media – 8

Frequency ranges for communication media and devices



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Features of Contemporary Telecommunications Systems – 12

Transmission Media – 9

- Satellite transmission system



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Features of Contemporary Telecommunications Systems – 13

Transmission Media – 10

- Transmission Speed Comparison

Twisted wire	Up to 1G+ Mbps
Microwave	Up to 200+ Mbps
Satellite	Up to 200+ Mbps
Coaxial cable	Up to 200 Mbps
Fiber-optic cable	Up to 6+ Tbps

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5. Communications Networks

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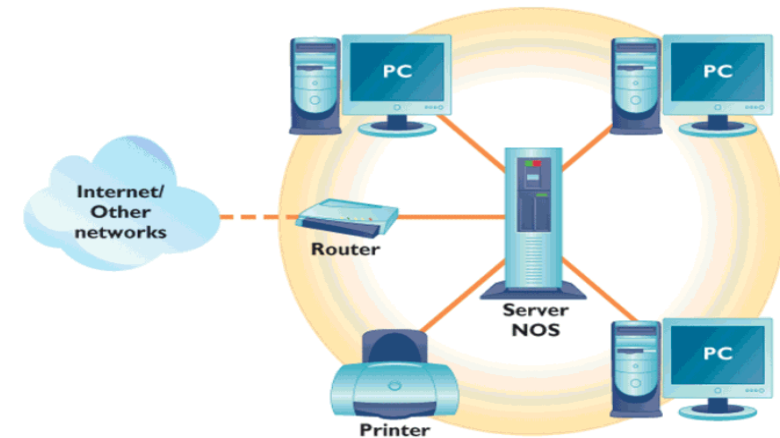
Communications Networks - 1

Local Area Networks (LAN) - 1

- A LAN is a data communication system allowing a number of independent devices to communicate directly with each other,
 - within a moderately sized geographic area,
 - and over a physical communications channel of moderate data rates.
- To implement a LAN, we need to use cabling or wireless technology to link up computers and networking devices, and the required software such as a Network Operating System (NOS).

Communications Networks - 2

Local Area Networks (LAN) - 2



Communications Networks - 3

Local Area Networks (LAN) – 3

- In a client/server arrangement, network services are located on a dedicated computer called a server. The server responds to the requests of clients for, print, application and other services.

Merits:

- The network is scalable.
- Enhanced security, ease of access, and control.

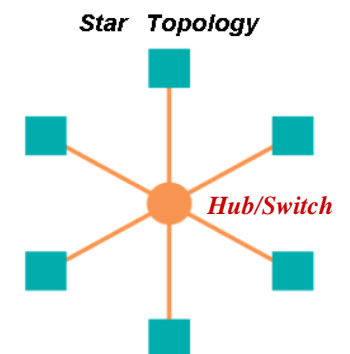
Demerits:

- Introduce a single point of failure in the network.
- More expensive, require specialized hardware and software.
- Require a trained, expert staff member to administer and maintain.

Communications Networks - 4

Local Area Networks (LAN) – 4

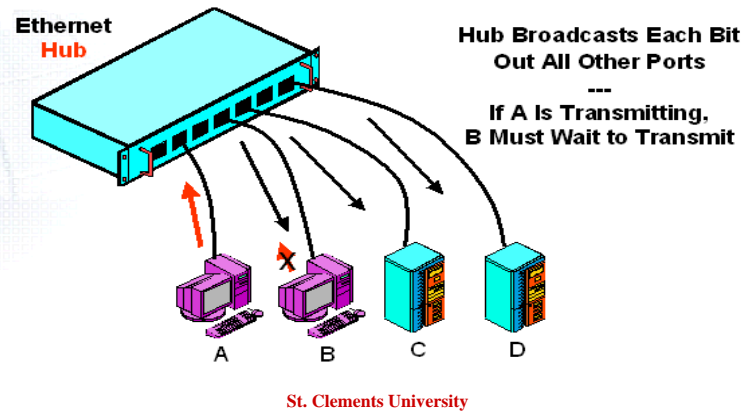
- Ethernet is by far the most common
- Star topology using Ethernet **hubs** and/or **switches**
- Use UTP cabling
- Relatively cheap, easy to install and manage
- Ethernet standards make use of latest developments in network technology



Communications Networks - 5

Local Area Networks (LAN) – 5

Hub Versus Switch Operation

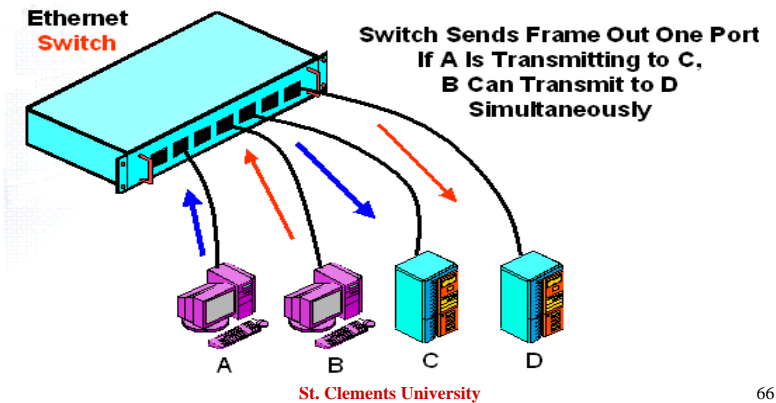


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Communications Networks - 6

Local Area Networks (LAN) – 6

Hub Versus Switch Operation



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Communications Networks - 7

Local Area Networks (LAN) – 7

Hub Versus Switch Operation

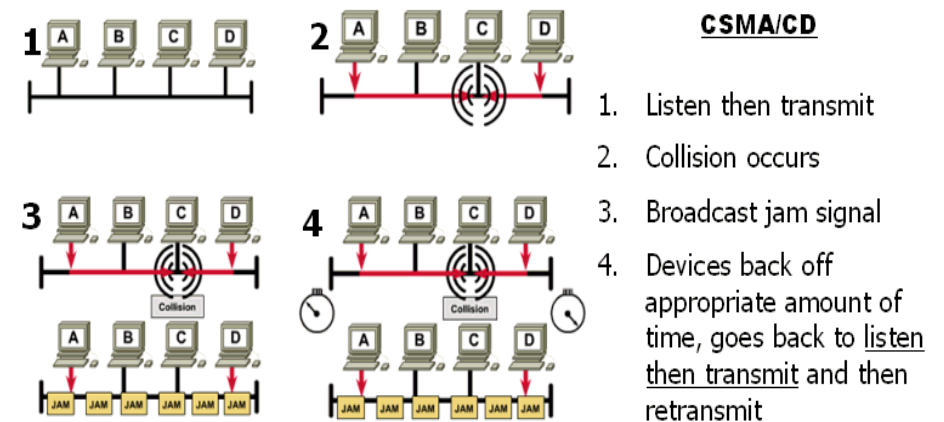
- **Hubs Need Media Access Control**
 - This limits when a station may transmit
 - Ethernet hubs use CSMA/CD
- **Carrier Sense Multiple Access (CSMA)**
 - Only transmit if no other station is transmitting
 - Otherwise, wait
- **Collision Detection (CD)**
 - If two NICs transmit at the same time, this is a collision
 - Both will stop, wait a random amount of time, and then go back to CSMA to send again

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Communications Networks - 8

Local Area Networks (LAN) – 8



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Communications Networks - 9

Local Area Networks (LAN) – 9

UTP dominates the Ethernet access line market

Physical Layer Standard	Speed	Maximum Run Length	Medium Required
10BASE-T	10 Mbps	100 meters	4-pair Category 3 or higher
100BASE-TX	100 Mbps	100 meters	4-pair Category 5 or higher
1000BASE-T (Gigabit Ethernet)	1,000 Mbps	100 meters	4-pair Category 5 or higher

Physical Layer Standard	Speed	Maximum Run Length	Medium 850 nm light (inexpensive) Multimode fiber	
1000BASE-SX	1 Gbps	220 m	62.5 microns	160 MHz-km

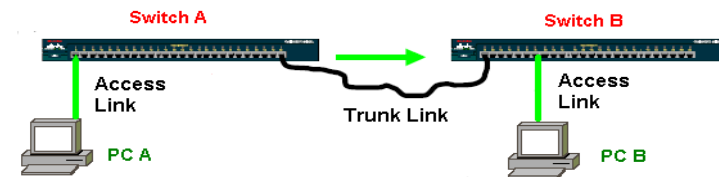
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Communications Networks - 10

Local Area Networks (LAN) – 10

- **Access links** to client stations today are dominated by 100BASE-TX
 - But 1000BASE-T usage is growing
- **Trunk links** today are dominated by 1000BASE-SX
 - Sufficient for most LAN trunk line distances and speeds
 - Short trunk links, however, use UTP
 - Longer and faster trunk links use other fiber standards

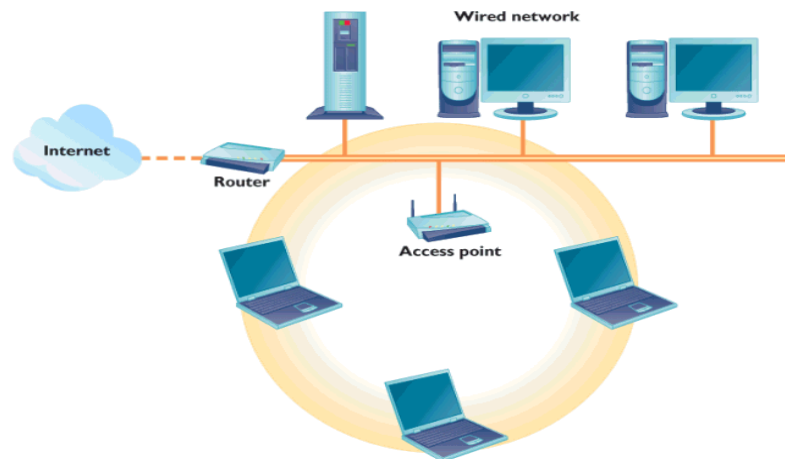


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Communications Networks - 11

Local Area Networks (LAN) – 11

An 802.11 Wireless LAN



Communications Networks - 12

Local Area Networks (LAN) – 12

Wireless LAN Benefits

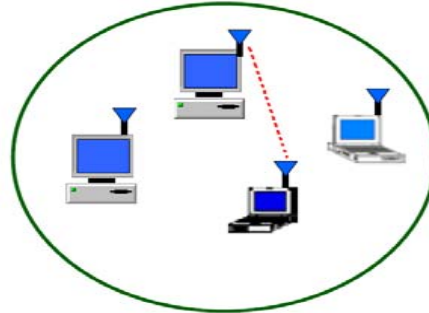
- **Removes wiring challenges**
 - Limited connections to users
 - Perfect for facilities where cost of wiring is prohibitive or impossible
- **Able to redeploy with minimal expense**
 - Low Installation Cost
 - Fast installation, Less Influence
 - Connect permanent or temporary campus buildings quickly and easily
- **Large coverage, High Performance**

Communications Networks - 13

Local Area Networks (LAN) – 13

Wireless LAN

- **Ad-hoc mode:** Peer-to-peer mode; wireless devices communicate with each other directly.
- It involves at least 2 stations
- No backbone infrastructure
- Suitable for small area



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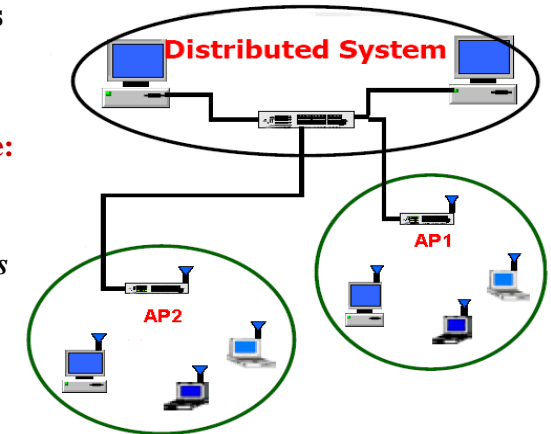
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Communications Networks - 14

Local Area Networks (LAN) – 14

Wireless LAN

- **Infrastructure mode:**
- Wireless devices communicate with wired LAN via *access points* (APs).



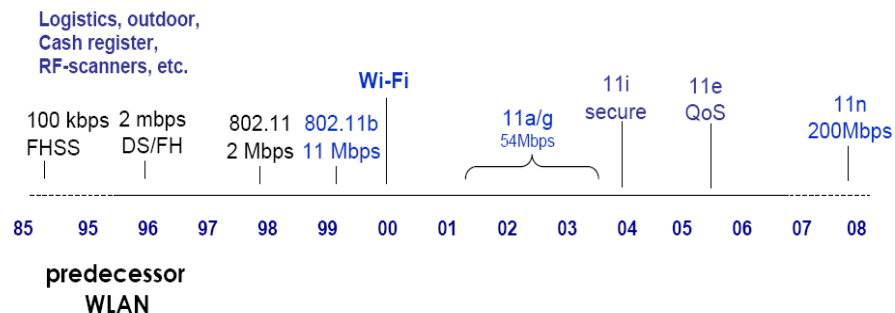
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Communications Networks - 15

Local Area Networks (LAN) – 15

• WLAN-standards



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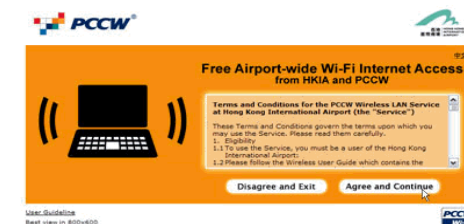
Communications Networks - 16

Local Area Networks (LAN) – 16

• Wireless LAN Standard

Standard	802.11b	802.11a	802.11g
Frequency Band	2.4 GHz	5 GHz	2.4GHz
Data rate	11 Mbps	54 Mbps	54 Mbps

- **Hot spot:** Geographic location in which an access point provides public Wi-Fi network service.
 - Eg. Free PCCW Wi-Fi service in the HK International Airport



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Communications Networks - 17

Local Area Networks (LAN) – 17

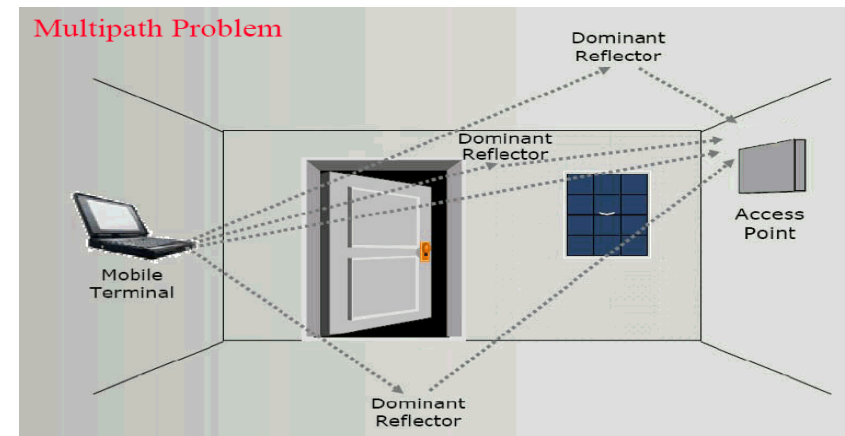
What is 802.11n?

- New IEEE Standard under development
- Uses MIMO radio technology as a basis
- End result will be more “wire-like” performance
- Anywhere from 100Mbps to 600Mbps depending on implementation
- First standard to support both 2.4 GHz and 5 GHz

Communications Networks - 18

Local Area Networks (LAN) – 18

Multi Path Reflections

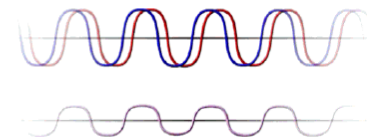


Communications Networks - 19

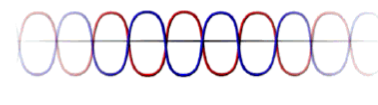
Local Area Networks (LAN) – 19

Multi Path Reflections

Original signal + reflections arrive at the receiver and are “added”, resulting in a distorted reconstructed signal



Null Waves : Original signal and reflected signals are 180 degrees out of phase, cancelling each other out.

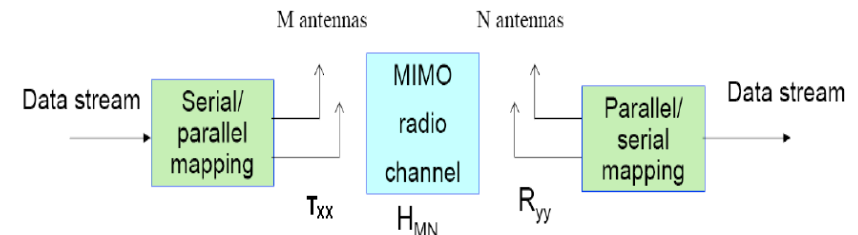


Causing drop outs.

Communications Networks - 20

Local Area Networks (LAN) – 20

- MIMO (Multiple Input / Multiple Output)
- Sending signals on multiple Tx antennas
- Receiving signals on multiple Rx antennas



Communications Networks - 21

Local Area Networks (LAN) – 21

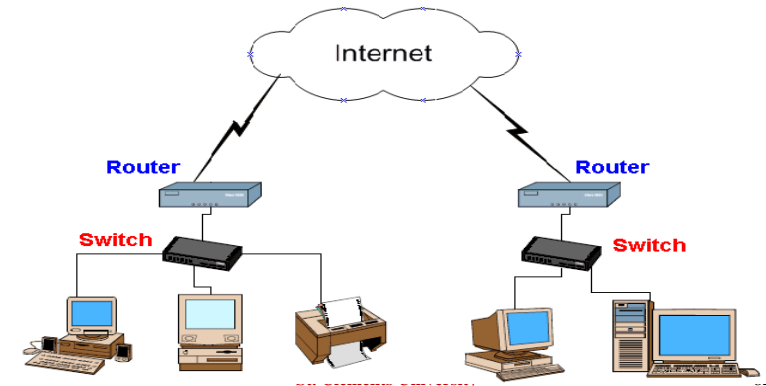
Bluetooth

- Standard for wireless personal area networks that can transmit up to **722 Kbps** within **10-meter area**
- It is a wireless LAN technology designed to connect devices of different functions such as telephones, notebooks, computers (desktop and laptop), cameras, printers and so on.
- A Bluetooth LAN is an ad-hoc network.
- The Bluetooth technology is the implementation of a protocol defined by the **IEEE 802.15** standard.
 - The standard defines a wireless personal-area network (PAN) operable in an area the size of a room or a hall.

Communications Networks - 22

Local Area Networks (LAN) – 22

- **Routers** provides access to company networks on other sites, and to the Internet.



Communications Networks - 23

Wide Area Networks - 1

- A WAN is a single networks that connect different sites
- WANs and the Telephone
 - WAN technology usually uses the Public Switched Telephone Network transport system for transmission
 - Adds data switching and management
- WAN Purposes
 - Internet access
 - Link sites within the same corporation
 - Provide remote access to individuals who are off site

Communications Networks - 24

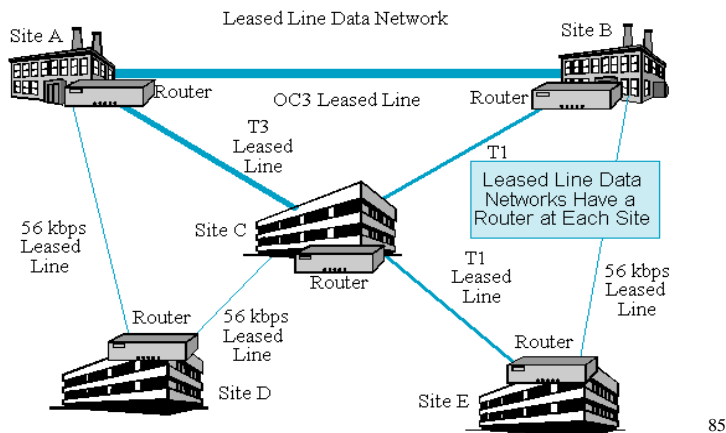
Wide Area Networks – 2

- WANs are characterized by **high cost** and **low speeds**.
- High cost per bit transmitted compared to LANs.
- Consequently, lower speeds (most commonly 128 kbps to a few megabits per second)
- This speed usually is aggregate throughput shared by many users
- Much slower than LAN speeds (100 Mbps to 1 Gbps to the desktop)

Communications Networks - 25

Wide Area Networks – 3

Leased Line Data Networks

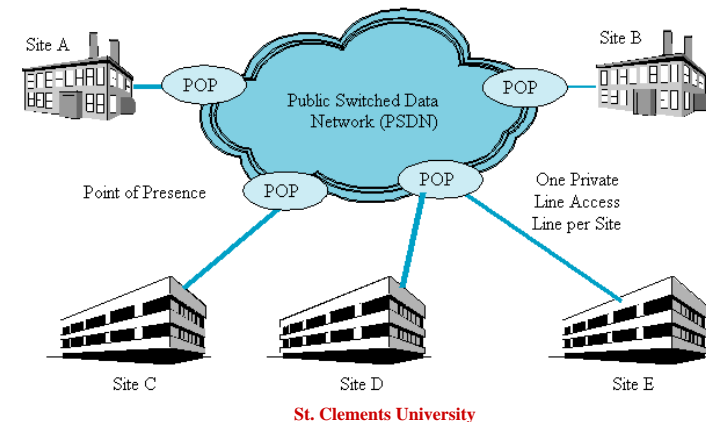


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Communications Networks - 26

Wide Area Networks – 4

WAN using Public Switched Data Networks



86

Communications Networks - 27

Source: HKBN

甚麼是「ADSL」?

ADSL，全名Asymmetric Digital Subscriber Line(非對稱數字用戶線)，是一種指上傳同下載寬頻速度不對等的寬頻接入技術。ADSL是本港最大寬頻網絡供應商主要採用的制式，沿用電話線加寬頻數據機(modem)為大部份用戶提供上下載不對等的寬頻上網服務。以市面上普遍的6M/8M寬頻上網服務為例，上傳的速度只有約0.6M/1M，是下載速度的十分之一！

互聯網發展的初期，大部份的網頁以文字為主，對速度的要求不需要太快；而且資訊多由網站下載至用戶的電腦，因此ADSL制式已足以應付最初上網的需要。



St. Clements University

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Communications Networks - 28

Source: HKBN

甚麼是「光纖入屋」?

即是Fibre-to-the-home (FTTH)，採用IEEE802.3z制式，是指由香港寬頻的網絡操控中心起至大廈，再由大廈至用戶住所內，整段線路全由光纖鋪設。光纖直入用戶電腦附設的光纖接入端口，提供100Mbps至1000Mbps的住宅寬頻服務。

想了解更多有關「光纖入屋」的寬頻服務計劃，請致電我們的查詢熱線128 100。



St. Clements University

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6. Networked Applications

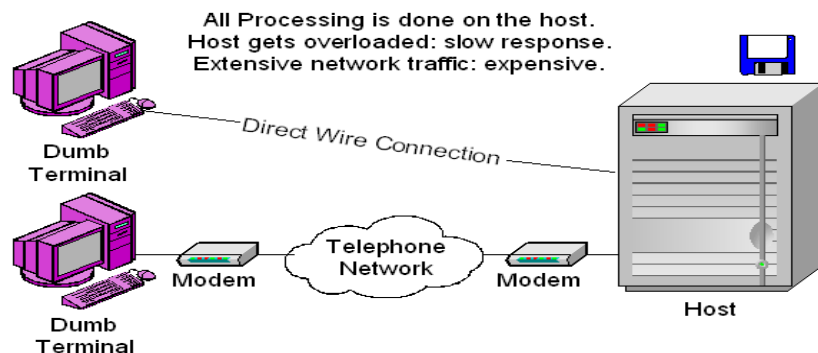
Application Architectures - 1

- An application architecture is the design decision about **which network host or hosts to use** to do the processing work in an application.
- Two type of application architecture:
 - Terminal-Host System
 - Client/Server Computing

Application Architectures - 2

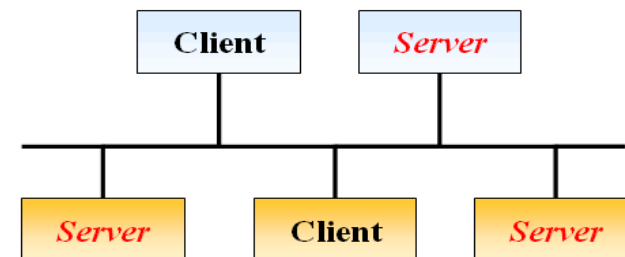
Terminal-Host System

- Applications and databases reside on the same host computer.
- User interacts with the application using a “**dumb terminal**”.



Application Architectures - 3

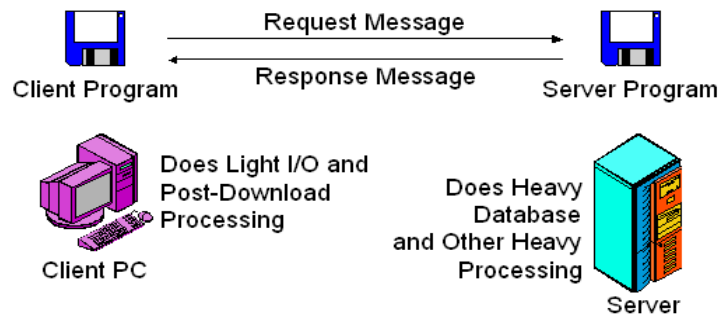
- Applications and databases reside on specialized host computers.
- Servers do most or all of the processing and transmit the results to the client.



Application Architectures - 4

Client/Server Computing

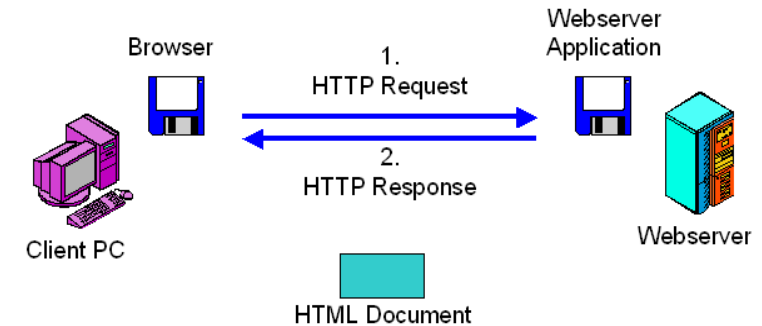
Client/Server Processing with Request-Response Cycle



Highly scalable: Use larger server as number of clients increases

Application Architectures - 5

Web Page Browsing



Web Search Engines

- Web pages that conduct searches of the Web to find words or expressions you enter.



E-Mail - 1

What is E-Mail?

- E-mail (electronic mail) is the exchange of computer-stored messages by telecommunication.

Mail Server

- A hardware and software system that determines from the recipient's address one of several routes on which to send the message.

Mail Client Software or E-Mail Program

- A software that requests mail delivery from the mail server to your PC.

Email Address

- An address that uniquely identifies an individual or organization that is connected to the Internet.
- mis.st.clements@gmail.com**

E-Mail - 2

Protocols that make email works

- **SMTP (Simple Mail Transfer Protocol)**
 - It decides which paths an e-mail message takes on the Internet.
- **POP (Post Office Protocol)**
 - It handles incoming messages.
- **IMAP (Internet Message Access Protocol)**
 - A protocol for retrieving mail messages from a server.
- **MIME (Multipurpose Internet Mail Extensions)**
 - A protocol that specifies how to encode non-text data, such as graphics and sound, so it can travel over the Internet.

E-Mail - 3

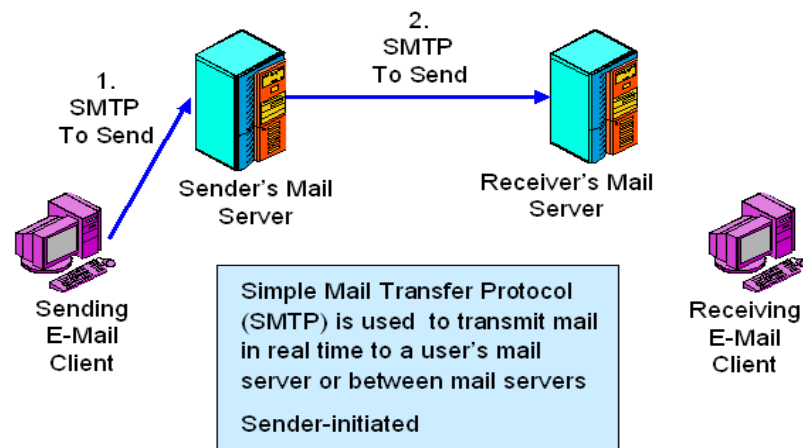
Importance of E-Mail

- Universal service on the Internet
- Attachments make e-mail a general **file delivery mechanism!**

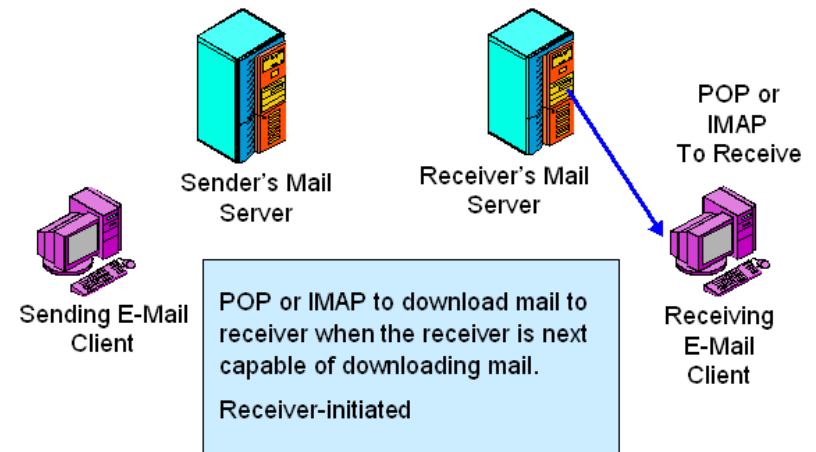
Mail Standards

- Message body standards
- Receiver must understand sender's message
 - RFC 822 and RFC 2822 for all-text bodies
 - HTML bodies with fancy text and graphics
 - UNICODE for non-English language characters

E-Mail - 4



E-Mail - 5



E-Mail – 6

The “evils” come with email:

- Messages with inappropriate content.
 - Racial or sexual harassment
 - Threats
- Spam, adware, spyware, and other abuses.
- Viruses, Worms, and Trojan Horses are often delivered by e-mail attachments!

E-Mail - 7

Viruses, Worms, and Trojan Horses

- Use of antivirus software is a must.
- Where to Do Scanning?
 - On client PCs
 - But users often turn off their software,
 - Fail to download virus definitions regularly
 - Or let their contracts lapse
 - On the corporate mail server or application firewall
 - Users cannot turn off

E-Mail - 8

- **Spam** are unsolicited commercial e-mail
- Why they are harmful?
 - Time consumed by users deleting them
 - Bandwidth and storage consumed
 - Legitimate messages lost because overlooked
- Separating SPAM from legitimate e-mail is difficult
 - Many spam messages get through to users
 - Some legitimate messages are deleted
 - Some firms merely mark messages as probable spam

E-Mail - 9

Web-Based E-Mail Services - 1

- Many Internet Web sites provide free e-mail addresses and accounts for **registered users**.
- They may be used with any Web browser.
- Examples: Gmail, Yahoo! Mail, Hotmail etc.



欢迎使用 Gmail



新功能! Gmail 聊天功能在此处

直接从 Gmail 内部与您的朋友们聊天，再也无需单独加载程序或查找新地址。只需点击一下鼠标，即可与通过电子邮件来往的人以及 Google Talk 网络中的人聊天。现在您甚至可以保存和搜索 Gmail 帐户中的聊天记录。聊天还是不错的。[了解更多信息](#)

[关于 Gmail](#)

Google 帐户

登录到 Gmail

用户名:

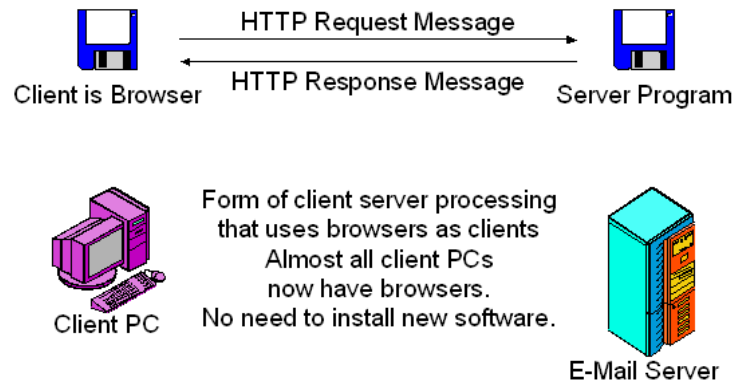
密码:

☐ 在此计算机上保存我的信息。

[无法访问我的帐户](#)

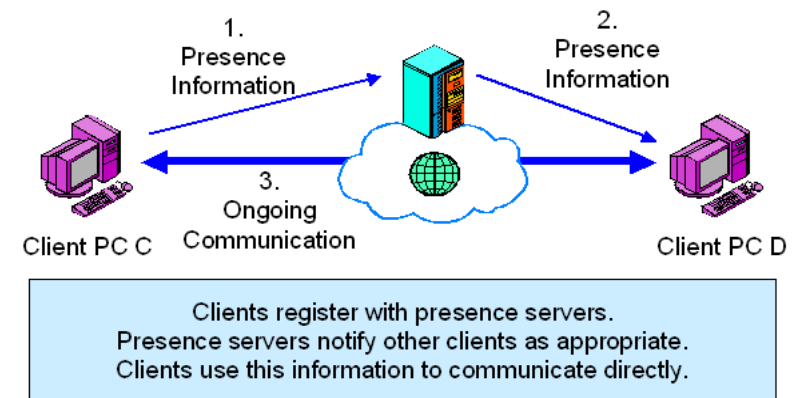
E-Mail - 10

Web-Based E-Mail Services - 2



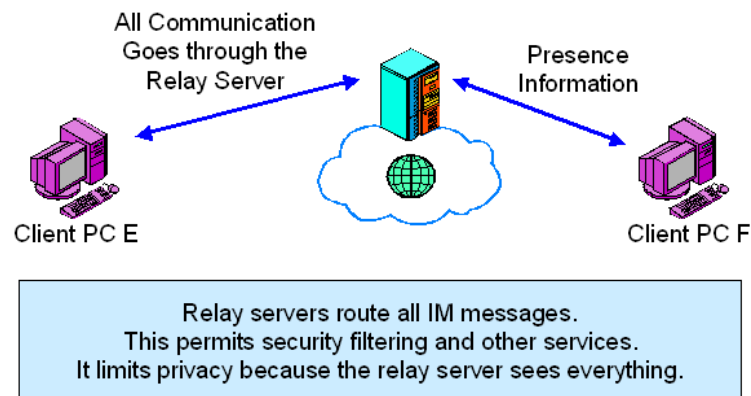
Instant Messaging Servers - 1

Use of a Presence Server



Instant Messaging Servers - 2

Use of a Relay Server



8. Contemporary Mobile Services

Mobile Enterprise

- Mobile Enterprise
 - “The *ability for an enterprise to connect* and control suppliers, partners, employees, assets, products, and customers *from any location*.”
 - Forrester’s March 15, 2006 Topic Overview “Enterprise Mobility”

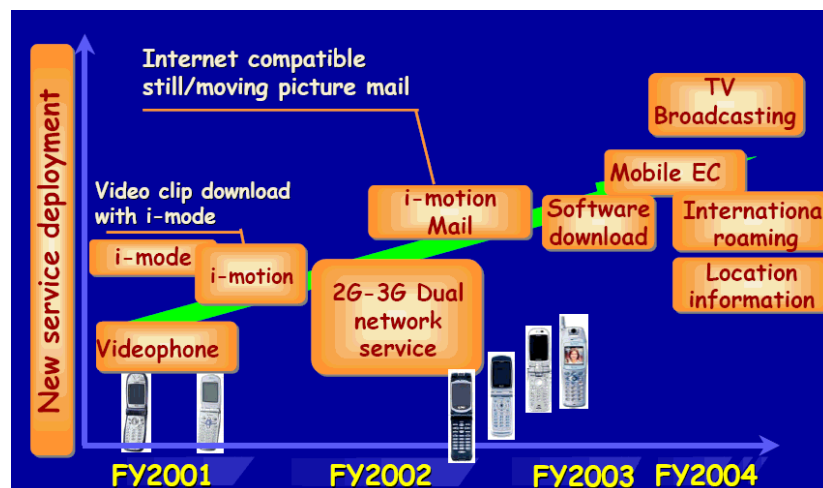
Broadband Wireless Networks...
Versatile Devices...
Faster Processors....



Generations of Mobile Networks

- 1G: basic mobile telephony
- 2G: mobile telephony for mass users
 - regional roaming
- 2.5G: mobile internet services
- 3G:
 - global roaming
 - enhanced mobile Internet services

3G Services – To explore the non-voice Applications



HSDPA

- **High-Speed Downlink Packet Access (HSDPA)** is a 3G mobile telephony communications protocol.
- It support services requiring instantaneous high data rates in the downlink, e.g. Internet browsing, video on demand, office application.
- Peak data rates 3-4 times higher than current 3G.
- Current HSDPA deployments support down-link speeds of 1.8, 3.6, 7.2 and 14.4 Mbit/s.
- New terminals are required to take advantage of HSDPA.

Smartone-Vodafone

The screenshot shows the Smartone-Vodafone website interface. At the top, there are navigation links for '聯繫更緊密', '體驗更精采', '事業更超卓', '手機及配件', and '關於我們'. Below this is a search bar and a language selector set to 'English'. The main content area is titled 'Contract 計劃' and features a large red banner for '無限任用隨身寬頻 每月只需\$188'. To the left, there is a sidebar with links for '隨身寬頻', '服務', '產品', '服務收費', 'Contract 計劃', 'Flexi 計劃', '最新優惠', '增值', '整理帳戶', 'FAQ', '條款及條件', and '致電海外及遨遊萬里'. The main content area also includes a table for '無限本地用星月費計劃' and a section for '日費計劃'.

無限本地用星月費計劃	
\$188 月費 最新	高達 3.6Mbps 下載 / 1.5Mbps 上載
\$348 月費	高達 7.2Mbps 下載 / 2Mbps 上載
簽約 24 個月，即送隨身寬頻 USB 裝置。 ¹	

我o地更有日費計劃，按日彈性收費，更切合非高用量用戶的o既上網需求。

日費計劃 ²	
\$68 月費	高達 7.2Mbps 下載 / 2Mbps 上載
+ \$18 每日使用費 ³	
\$588 隨身寬頻 USB 裝置，簽約 18 個月。 ¹	

Public Wi-Fi Service

- 每日港幣 18 元使用費，即可全日無限量使用 HSDPA、3G 本地資料傳輸。



PCCW NEXTGEN HSPA+ 21Mbps 流動新技術 - 1

- 預料支援 HSPA+ 的裝置將於09年第二季推出。



PCCW NEXTGEN HSPA+ 21Mbps 流動新技術 - 2

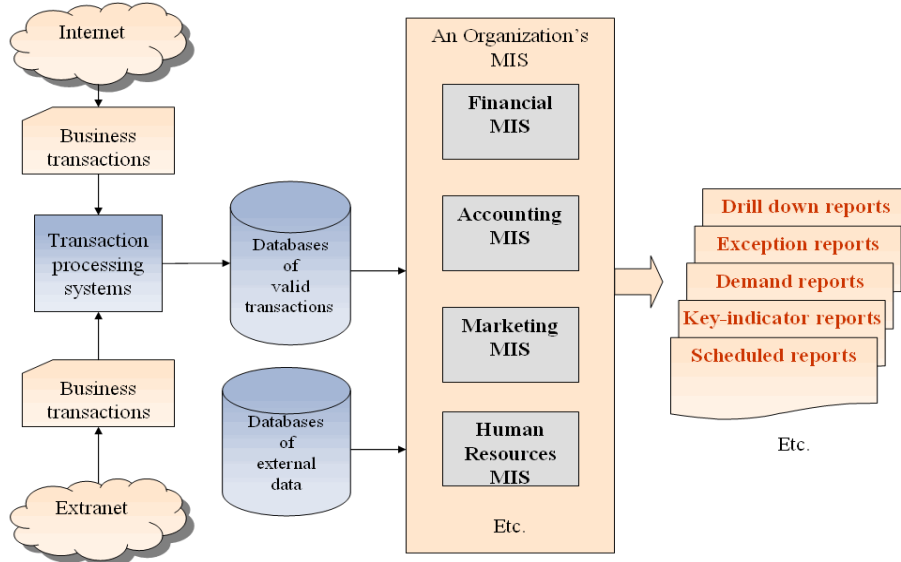
- Evolved High Speed Packet Access, HSPA+) 技術，將手機下載速度由現時的 7.2Mbps 激增三倍至 21Mbps
- 目前，市場上流動通訊業者一般沿用的基幹線路網絡是傳統的 E1 歐洲制式，每條陸上線路的傳輸速度只稍微高於 2Mbps。
- 然而，電訊盈科的全光纖基幹線路為客戶提供數據高速公路」，助他們享用超越 1000Mbps 的超高速上網服務。

9. MIS Types

Management information system (MIS) - 1

- An MIS provides managers with **information** and **support** for effective decision making, and provides feedback on daily operations.
- Output, or reports, are usually generated through accumulation of transaction processing data.
- MIS is an **integrated collection of functional information systems**, each supporting particular functional areas.
 - Provides reports based on **routine flow of data**
 - Assists in **general control** of the organization

Management information system (MIS) - 2



Management information system (MIS) - 3

Outputs of an MIS

Scheduled reports

- Produced periodically, or on a schedule (daily, weekly, monthly)

Key-indicator report

- Summarizes the previous day's critical activities
- Typically available at the beginning of each day

Demand report

- Gives certain information at a manager's request

Exception report

- Automatically produced when a situation is unusual or requires management action

Drill Down Reports

- Provide detailed data about a situation. To move from summary data to lower and lower levels of detail.

Major Types of Systems

- Transaction Processing Systems (TPS)
- Management Information Systems (MIS)
- Decision Support Systems (DSS)
- Executive Information Systems (EIS)

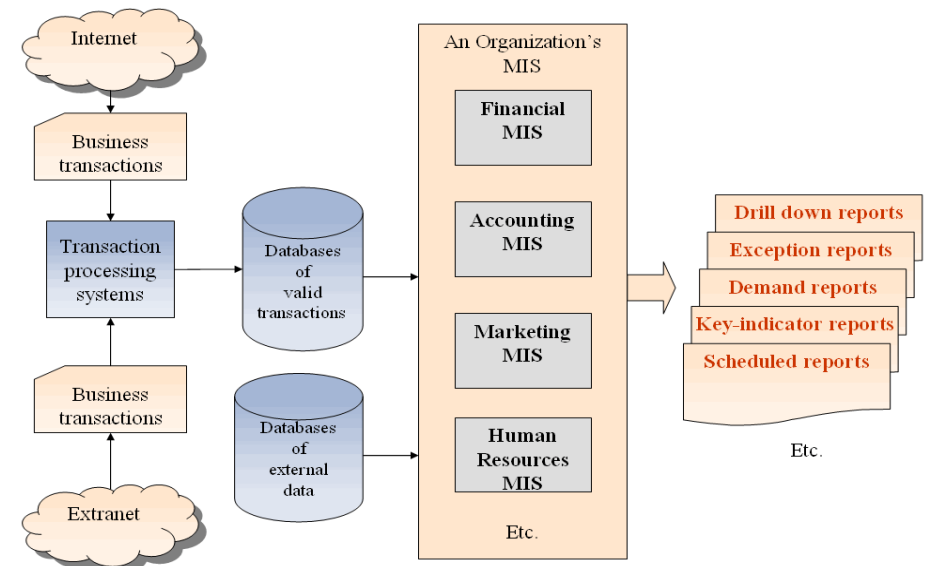
Transaction Processing Systems (TPS)

- A Transaction Processing System (TPS) is a type of information system that collects, stores, modifies and retrieves the data transactions of an enterprise.
- In computer science, transaction processing is information processing that is divided into individual, indivisible operations, called transactions.
- Each transaction must succeed or fail as a complete unit; it cannot remain in an intermediate state.
- Transaction processing allows multiple individual operations to be linked together automatically as a single, indivisible transaction.
- Transaction processing is designed to maintain a database in a known, consistent state.

Management information system (MIS) - 1

- Also called “information reporting systems”
- Original type of management support system
- Produce information products that support many of the day-to-day decision-making needs of the organization
- Output, or reports, are usually generated through accumulation of transaction processing data.

Management information system (MIS) - 2



Management information system (MIS) - 3

Major types of MIS Reports

Scheduled reports

- Produced periodically, or on a schedule (daily, weekly, monthly)

Key-indicator report

- Summarizes the previous day's critical activities
- Typically available at the beginning of each day

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- Gives certain information at a manager's request

Exception report

- Automatically produced when a situation is unusual or requires management action

Drill Down Reports

- Provide detailed data about a situation. To move from summary data to lower and lower levels of detail.

Decision Support Systems (DSS) - 1

- Decision Support Systems (DSS) are a specific class of computerized information system that **supports** business and organizational **decision-making activities**.
- A properly designed DSS is an interactive software-based system intended to help decision makers compile useful information from raw data, documents, personal knowledge, and/or business models to identify and solve problems and make decisions.

Decision Support Systems (DSS) - 2

- Some Sophisticate Functions of DDS
- What-If Analysis.
 - An end user makes changes to variables, or relationships among variables, and observes the resulting change in the value of other variables.
- Sensitivity Analysis.
 - A special type of what-if analysis in which the value of only one variable is changed repeatedly, and the resulting changes on other variables are observed.

Executive Information Systems (EIS) - 1

- Information systems at the organization's top level of management.
- Designed to address unstructured decision making through advanced graphics and communication but easy to use.
- Information sources from both inside and outside of the firm.

Executive Information Systems (EIS) - 2

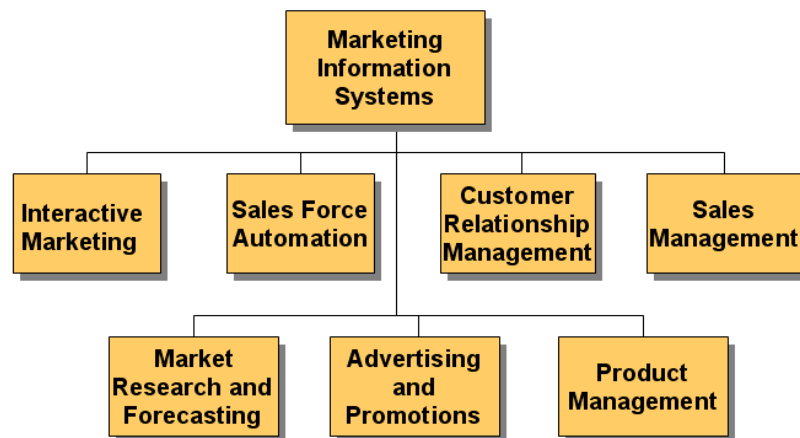
- Help minimize amount of information by giving key figures where point to level of success / failure.
- E.g. possible success factors for sales manager:

Success area	Factors	Critical?
Business growth / Profitability	% sales volume growth	
	% revenue growth	
	No new business proposals submitted	
	% revenue from new proposals	C
	% profit growth cost/revenue ratio	C
Personnel	% staff satisfied with management	
	% annual staff reviews by due date	
	To financial staff targets	C
Head office reporting	To financial branch targets and budgets	C
	% monthly reports on time	
Market awareness	To initiate market research programme	

How IS Support Marketing - 1

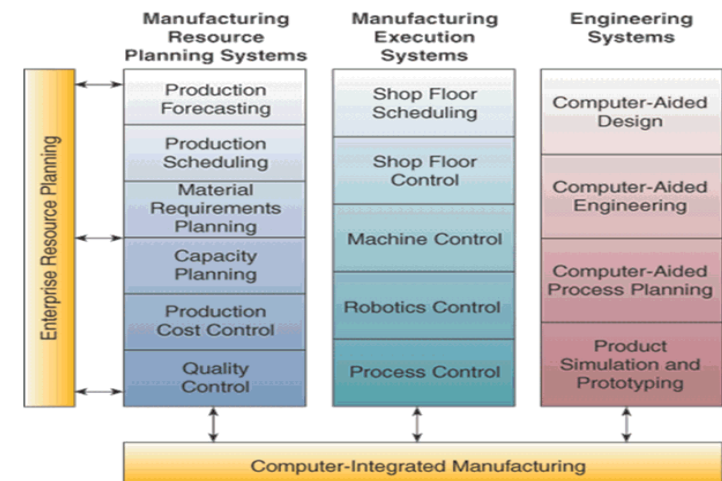
- **Goal:**
 - To profitably attract and keep customers
 - To induce retained customers becoming partners with the business by creating, purchasing and improving products and services
- A customer-focused marketing process
- Using the Internet, intranets, and extranets to establish two-transactions between a company and its customers or potential customers

How IS Support Marketing - 2

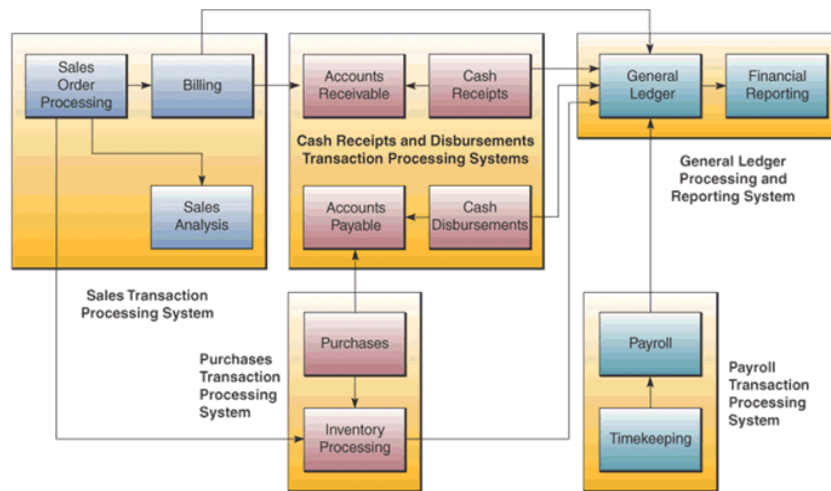


How IS Support Production and Operation

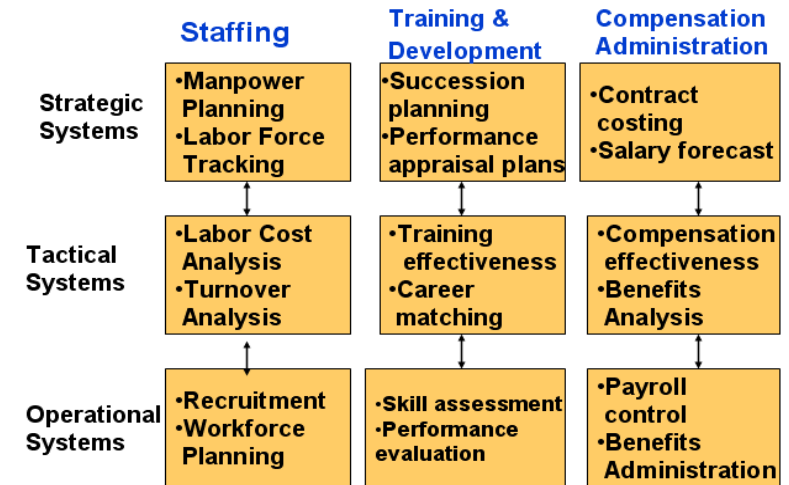
Computer-integrated manufacturing (CIM)



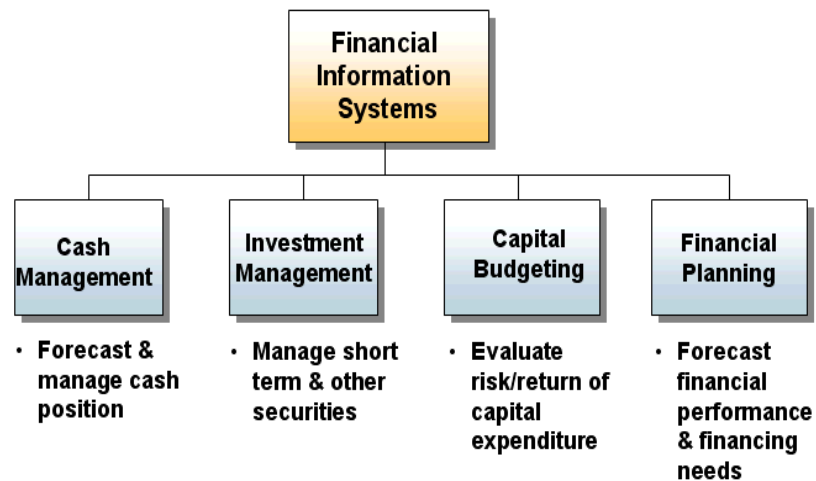
How IS Support Accounting



How IS Support Human Resources



How IS Support Finance



10. Management of MIS

MIS Management - 1

Managing Hardware and Software

- **Capacity planning:** Process of predicting when a computer hardware system becomes saturated
- **Scalability:** Ability of a computer, product, or system to expand to serve a larger number of users without breaking down

MIS Management - 2

- Total Cost of Ownership (TCO) of Technology Assets
 - Includes both direct and indirect costs
 - Hardware and software acquisitions account for only 20% of TCO
 - TCO for a PC may run to three times original purchase price
 - Be aware of hidden costs!

END