



IT Concepts for The Business User

By

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Bits and Bytes

- Bits & Bytes and the world of HEX/ASCII/EBCIDIC/UTF-8 UTF-16
 - ▶ The basic unit of memory is a Bit (1's and 0's). Patterns of 8 bits (HEX Base 8) are called bytes. The coding scheme that converts these patterns into alpha-numeric and symbols are:
 - ASCII Most commonly used pattern
 - UTF-8 (replacing ASCII)
 - UTF-16 for 16 bits
 - EBCIDIC – IBM's nomenclature
- RAM vs. Disk
 - ▶ RAM - today we use DRAM (Dynamic) which is the active memory in the computer.
 - ▶ Disk is the device that holds objects such as files. Like a bookcase, it is organized by folders and files.

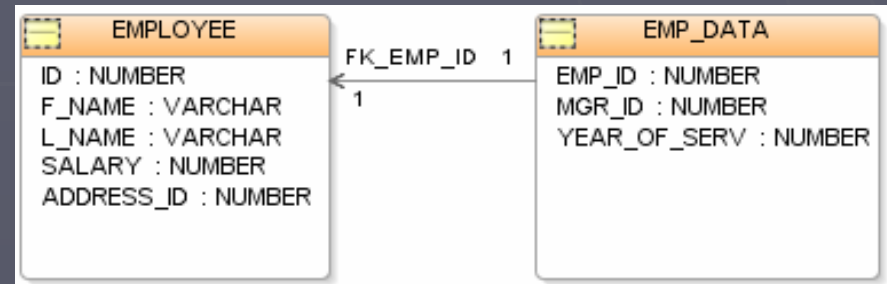


Folders and Files

- ▶ On your PC, Laptop or Netbook
 - Your computer's disk storage is like a file cabinet.
 - Within the file cabinets there are folders and folders within folders creating a hierarchy.
 - Within each folder there are files. They may be:
 - ▶ Program files with extensions such as .exe , .com, .dll
 - ▶ Data files with extensions such as .doc, docx , .wks, .xls, xlsx, ppt, pptx, .txt, .csv, .xml etc
 - ▶ Music files that have extensions such as .mid,.mp3,.wav,.wma
 - ▶ Video files with extensions .3gp,.avi,.mov,.mp4,.mpg,.swf,.wmv
 - ▶ Compressed files with extensions .zip, .gz
 - ▶ Backup files with extensions .bak, .tmp.

What is a database?

- ▶ A database is a structured collection of records or data that is stored in a computer system.
- ▶ Most common databases today are
 - Microsoft® SQL Server
 - Oracle ®
 - IBM's ® DB/2
 - MySQL®.



What is SQL?

- ▶ SQL Stands for Structured Query Language
 - It is a semi standardized language for accessing data from databases
 - An example
 - ▶ SELECT FIRST_NAME, LAST_NAME, SSN FROM EMPLOYEE_TABLE WHERE DEPT = 'ACCOUNTING' ORDER BY LAST_NAME

| FIRST_NAME | LAST_NAME | SSN |
|------------|-----------|-------------|
| SAM | SMITH | 555-55-1234 |
| TOM | TREE | 555-55-8888 |

Email

- ▶ Virtually everyone uses e-mail today. Most have business addresses and separate home accounts. The major business e-mail software applications are:
 - Microsoft Exchange Server (Outlook)
 - ▶ Excellent integration with Microsoft Office Suite
 - ▶ Excellent calendar
 - ▶ Prone to malicious e-mail attacks (Trojans, virus, malware).
 - IBM Lotus Notes ®
 - ▶ Number 2 in popularity
 - ▶ Integrates with IBM's Notes business package which is an excellent work flow package.
- ▶ Home e-mail is predominantly browser based
 - ▶ Google® (Gmail)
 - ▶ Yahoo®
 - ▶ Microsoft (Hotmail)
 - ▶ Comcast® , AT&T®, Charter®, Verizon®, Cablevision®.

Information Storage

- ▶ Information can be stored in different places. The fastest access is in the computer memory.
- ▶ Disks can reside in the computer or attached through a network
 - File Servers – Store information going through a server or a device typically called a NAS (Network Attached Server).
 - A SAN (Storage Area Network) connects multiple servers and different storage devices on a single network. This is typically faster than a NAS and enables faster backup and recovery but is much more expensive.
- ▶ USB Flash Drives have replaced the Floppy Disk and can store many gigabytes of data.

Whose Who in the IT Department

2/2

- ▶ Operators
 - Maintain the computer system.
- ▶ Communications Engineers
 - Design develop and maintain the data networks. They protect us from unwanted communications.
- ▶ Web Specialists
 - Design, develop and maintain the Internet and Intranet web pages.
- ▶ Consultants
 - Provide the support to augment and enhance the IT staff.



Types of Software 1/3

► Systems Software

- Wikipedia defines an Operating System (commonly abbreviated *OS* and *O/S*) as the infrastructure software component of a computer system. The operating system acts as a host for applications that are run on the machine. The most common operating systems in use today are :
 - Windows – The most common operating system used today. The latest version is called Vista which has met much resistance in the business world due to its security restrictions and issues with executing older software. Many organizations still use Windows XP. The next release, Windows 7.0 has received excellent reviews from the field.

Types of Software 2/3

- ▶ Linux/Unix - Linux the GUI (Graphical User Interface) version of Unix is "Open Source" (not related to any specific computer manufacturer). It is very popular in the engineering and scientific communities. It's drawback today is it's graphics and ability to compete against Microsoft.
- ▶ MAC® OS – is the operating system of Apple's MAC products. Today it is, in reality, a version of UNIX.
- ▶ IBM i is the Legacy Mid Range System OS. In the past it has been referred to as AS400 iSeries and now i.
- ▶ IBM z is the name for IBM's Mainframe operating system originally called System 390.

Types of Software 3/3

- Application Software

- ▶ Wikipedia definition: Application Software is any tool that functions and is operated by means of a computer, with the purpose of supporting or improving the software user's work.
- ▶ Types of Application Software include
 - Enterprise Resource Planning (ERP)
 - ▶ Top Tier vendors include SAP®, Oracle®, INFOR® Suite
 - Warehouse Management Systems (WMS)
 - Customer Relationship Management (CRM)
 - Computer Aided Design (CAD/CAM)
 - Business Process Management (BPM)
 - Business Analysis and Intelligence (BI).

Common programming languages

- ▶ JAVA and Java Script
 - Created by SUN Computer, this is a leading “Object Oriented” programming language. There are numerous Frameworks which have been developed that provide powerful capabilities. Many users develop applications using the Eclipse Development Studio which is an Open Source project.
- ▶ PHP, PERL, Python, Ruby, Delphi
 - These languages were developed by enthusiastic programmers and were adapted by Web developers due to the ease of use and power.
- ▶ Web HTML, XHTML
 - Web Pages are presented using a presentation tagging language called HTML (now being replaced by XHTML). It can run mini programs written in JAVA Script.
- ▶ .NET C#, VB.NET, J#
 - The .NET family of object oriented programs are based on Microsoft's© Framework that provide powerful and easy to use interfaces.
- ▶ Legacy COBOL, RPG, BASIC, FORTRAN, PL/I, PASCAL, C, C++
 - The most prevalent languages that are used in Mid Range and Main Frame Systems.

Data Communications

- ▶ Data Communications plays a major role in Information Technology
 - Role of an ISP -- The Internet Service Provider is the company that links us to the Internet. When we look up a web page, they provide the Domain Name Server (DNS) which gives the actual location. For many, the ISP can be our cable or telephone provider.
 - Dial Up -- Connectivity via phone lines (Plain Old Telephone POTS) is rapidly being phased out and being replaced by much higher speed technologies.
 - ISDN -- This is a special phone line (actually 2 tied lines) that provides a higher bandwidth (speed).
 - DSL – This is the primary high speed technology used by phone companies.
 - T1/T3/OC3 High Speed Dedicated Lines
 - ▶ T1= 1544kbps (bps is bits per second)
 - ▶ T2=6312 kbps
 - ▶ T3= 44736 kbps
 - ▶ OC-3 155 mbps.
 - Just as we have the Internet for public access, many of the telecommunication carriers provide a secure version for their customers. Among the top vendors are: AT&T, Sprint, and Verizon.

Security Concerns 1/2

- ▶ The # 1 cause of damage today is an accidental security breach by a staff member.
- ▶ The # 2 cause is an intentional security breach by a staff member or former staff member.
- ▶ The # 3 cause is a breach by an outsider!

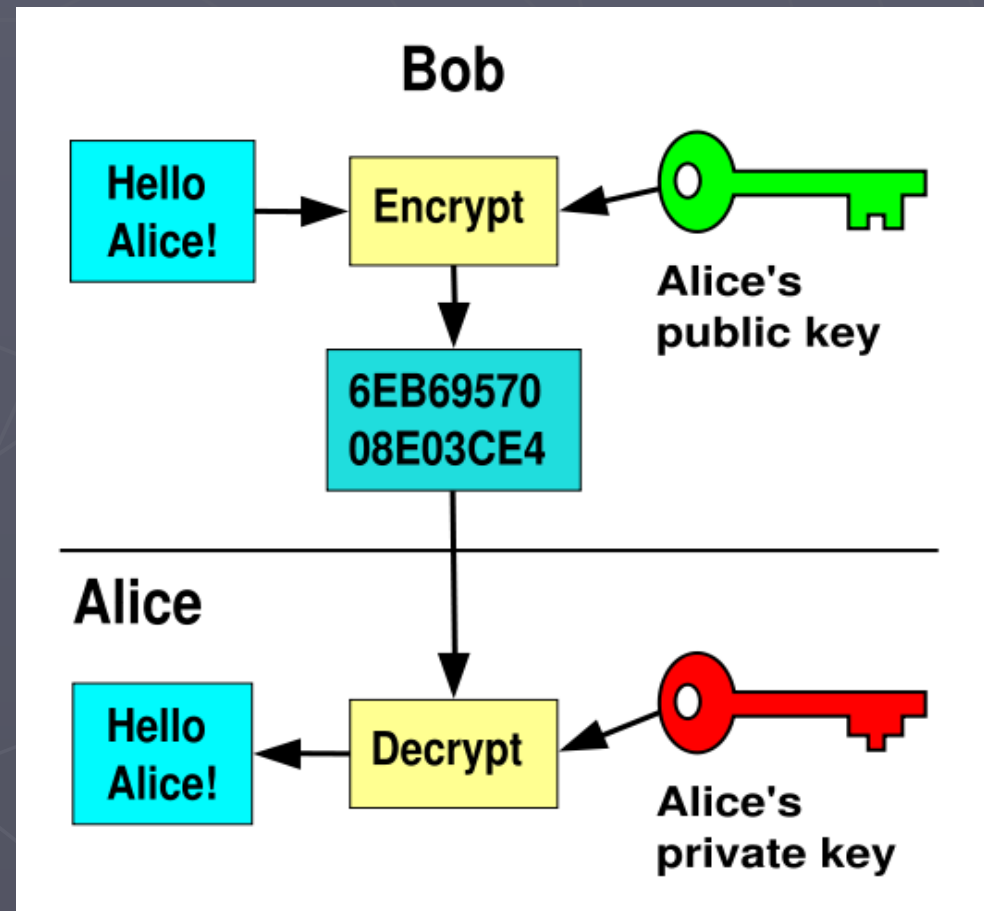
Security Concerns 2/2

- ▶ In order to protect our data and conform to security regulations for SOX, HIPPA and other legislation, critical information such as medical records, social security and personal information as well as sensitive business information must be encrypted (converted into seemingly non intelligible formats). To retrieve the information it is then decrypted.
- ▶ One of the earliest public key encryption applications is Pretty Good Privacy (PGP®)

Key Encryptions

- ▶ **Public-key cryptography** is a method for secret communication between two parties without requiring an initial exchange of secret keys.
- ▶ **Asymmetric cryptography**, the key used to encrypt a message differs from the key used to decrypt it. In public key cryptography, a user has a pair of cryptographic keys—a **public key** and a **private key**.
- ▶ **Secret-key cryptography**, also known as symmetric cryptography, uses a single secret key for both encryption and decryption.

(wikipedia)



E-Mail & Browser Security 1/2

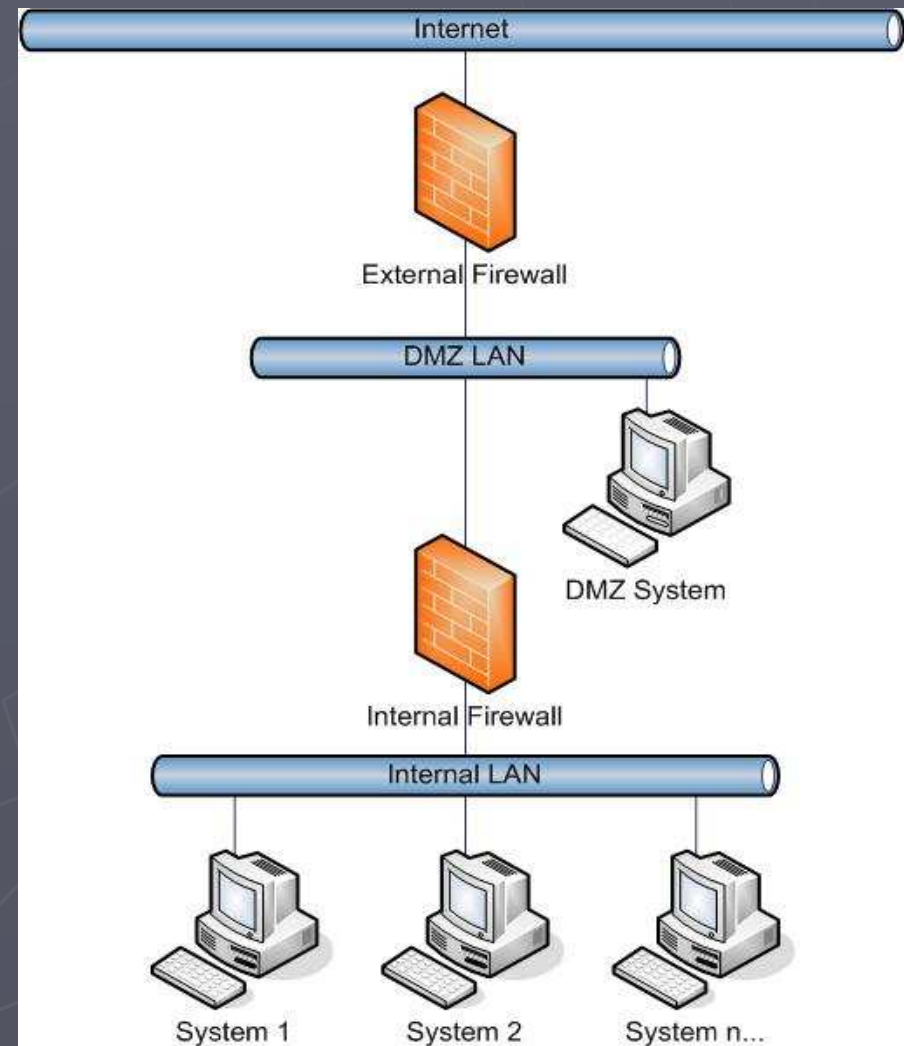
- ▶ Most security breaches occur due to malware imbedded in either a rogue web page or an e-mail. The most common forms of invasion are through:
 - ▶ Virus - a software program capable of reproducing itself and capable of causing great harm to files or other programs on the same computer
 - ▶ Spyware - This is software that secretly gathers user information while he/she navigates the Internet. This information is normally used for advertising purposes. Spyware can also gather email addresses, passwords and credit card numbers.
 - ▶ Worm - a software program capable of reproducing itself that can spread from one computer to the next over a network; "worms take advantage of automatic file sending and receiving features found on many computers".

E-Mail & Browser Security 2/2

- ▶ Trojan - a program that appears desirable but actually contains something harmful; "the contents of a Trojan can be a virus or a worm.
- ▶ Phishing is the fraudulent process of attempting to acquire sensitive information by masquerading as a trustworthy site .
- ▶ SPAM - Spam is unsolicited e-mail on the Internet. From the sender's point-of-view, it's a form of bulk mail, often to a list culled from subscribers to a Usenet discussion group or obtained by companies that specialize in creating e-mail distribution lists.

Web Server Security

- ▶ Since a web server is a device that links to the internet, it is a weak spot that intruders use to try to break into networks. It can not be completely hidden and usually sits between a Firewall (protection hardware/software) and the Internet. Since access is directly needed, it is partially shielded by the DMZ (Demilitarized Zone)



Security Tools

- ▶ Smart Cards
- ▶ Biometric Devices
- ▶ Encryption Flash



Disaster Recovery Planning 1/2

- ▶ Enterprise Task not just IT!
 - Disasters strike at the least expected time. It may be minor issues such as a major snow or ice storm, electrical outages or may be major events such as fires, earthquakes or man made events such as 9/11
- ▶ What is the cost of down time?
 - For each hour that the enterprise can not do business, what is the cost? What is the impact to customers? Will the customers go to your competitor and not return?

Disaster Recovery Planning 2/2

- ▶ The phases of DRP are
 - Planning – Develop a comprehensive plan that covers the entire organization, not only Information Technology.
 - Testing the plan – Make sure everyone knows his or her role and test the plan annually.
 - After an incident, perform a post mortem to see what was done right and what should be improved next time.
 - Periodically revisit the plan and improve it.

Off Site Storage

▶ Traditional

- Documents and Electronic Information stored on tapes and disks should be stored off site in a secure, fire safe location.
- Will the documents be available in the event of a disaster?

▶ E-Vaulting

- Stores the electronic documents in a secure location using the Internet. This is a relatively new technology that removes the potential problem of bad data on tapes.

Hot Technology 1/2

- ▶ Web Service – The client (user) passes information over the Internet to a server that performs a process and then sends the information back to the client. There is usually a fee paid by the client for the service.
- ▶ SOA – (wikipedia) In computing, **service-oriented architecture** provides methods for systems development and integration where systems function around business processes and packages. SOA also describes IT infrastructure which allows different applications to exchange data with one another as they participate in business processes.
- ▶ SaaS – “Software as a Service” describes the use of applications over the internet. The users pay a fee for the use of the service. A well known example of this is Salesforce.com. In the past, this was known as Timesharing.

Hot Technology 2/2

- ▶ Cloud Computing - This is an extension of SaaS where the applications are developed and located on servers that can be located anywhere. Today this technology is being advanced by Google, and SalesForce.com ®. In the near future, many of the major IT vendors will offer Cloud Computing.
- ▶ Web 2.0 (Wikipedia) - The term "Web 2.0" describes the changing trends in the use of World Wide Web technology and web design that enhances creativity, secures information sharing, provides enhanced collaboration and functionality of the web. Web 2.0 concepts have led to the development and evolution of web culture communities and hosted services such as social-networking sites, video sharing sites, wikis, blogs and folksonomies.



- ▶ Ada Business Technology specializes in:
 - Business & Manufacturing System
 - IT Governance
 - Project Management
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