Maintaining The Operating System

- Operating systems and applications software continue to evolve.
- Users need to keep their systems up to date:
  - To ensure they have the latest features.
  - Systems operate efficiently.
  - Protected against attacks.
Patches

- After an OS or application is installed, keeping it up to date with the latest patches is important.

  A patch is a piece of program code that can correct a problem or enhance the functionality of an application program or OS.

- The size of patches may vary from a few kilobytes to hundreds of megabytes.
- It is usually provided by the manufacturer to repair a known vulnerability or reported problem.

- In most cases a patched OS results in a healthier, more stable computer.

- Computers should be continually updated with the latest patches unless a good reason exists not to do so.
Sometimes patches negatively impact the operation of another system feature.

The impact of the patch should be clearly understood before it is applied.

The software manufacturer’s website usually provides this information.
Applying OS Patches

- Patches to operating systems can be installed in different ways.
- Depending on the OS and the needs of the user.
- Options for downloading and installing updates include the following:
  - Automatic installation
  - Prompt for permission
  - Manual
**Automatic installation**: The OS can be configured to connect to the manufacturer’s website and then download and install minor updates without any user intervention.

Updates can be scheduled to occur during times when the computer is on, but not in use.
- **Prompt for permission**: Some users want to have control over which patches are applied.
- This choice is often the one for users who understand what impact a patch can have on system performance.
- The system can be configured to notify the end user when a patch is available.
- The user must then decide whether to download and install the patch.
**Manual**: Updates that require major pieces of code to be replaced on a system should be run manually.

These major updates are often called service packs and are designed to correct problems with an application or OS, and sometimes to add functionality.

These service packs usually require the end user to manually connect to a website, download files, and install the update.

They can also be installed from a CD available from the manufacturer.
Figure 1: Windows Automatic Updates
Application Patches and Updates

- Applications also require patches and updates.
- Patches are usually released by the manufacturer to repair a detected vulnerability in the application that could lead to undesirable behavior.
- Browsers and office software such as word processors and spreadsheet and database applications are common targets for network attacks.
These applications require updates to correct the code that might allow the attack to succeed.

The manufacturer might also develop updates that can improve product functionality, at no additional cost.

OS and application patches are generally found through the manufacturer’s website.
The installation process might request permission to install the update and to verify that any supporting software is present.

The installation process might also install any programs that are required to support the update.

Web updates can be downloaded to the system from the Internet and installed automatically.
Figure 2 shows the Internet Explorer Security Warning that is displayed before an update is downloaded and installed.

![Figure 2: Installing an Update from the Internet](image)
Security Patches

- A security patch is a change applied to an asset to correct the weakness described by a vulnerability.
- This corrective action will prevent successful exploitation and remove or mitigate a threat’s capability.
- Security patches are the primary method of fixing security vulnerabilities in software.
Hot Patching

- Hot patching is a technology that allows patches to be applied without shutting down and restarting the system or the program.
- This addresses problems related to unavailability of service provided by the system or the program.
- A patch that can be applied in this way is called a hot patch.
Tools

- There are several tools to aid in the patch application process, such as RTPatch, JUpdater, StableUpdate or Visual Patch.

- WinZip Self-Extractor can launch a program that can apply a patch.
Operating System Version

- Windows
- Linux
- Unix
- Sun Solaris
- Mac OS
Windows Operating System

- **Microsoft Windows** is a series of software operating systems and graphical user interfaces produced by Microsoft.
- Microsoft Windows came to dominate the world's personal computer market, overtaking Mac OS, which had been introduced previously.
Describe the evolution of Windows operating system

- 1980 – introduction to MS-DOS
- 1990 – Windows NT
- 1995 – Windows 95
- 1997 – Windows NT Version 4
- 2001 – Windows XP
- 2005 – Windows Vista
- 2009 – Windows 7
1980 – introduction to MS-DOS

- Microsoft began to market operating system with the introduction of MS-DOS
- Shipped with early IBM Personal computers under the name PC-DOS
- Refined MS-DOS, culminating in a version that supported graphic windows and multitasking

1990 – Windows NT

- Development of Windows NT operating system was well underway by 1990
- Released for public use in July, 1993
1995 – Windows 95

- MS_DOS Windows system was replaced by two new windows operating system
  - Windows 95
    replace MS-DOS with windows on personal computer
  - Windows NT
    aimed at machine that had been configured with more resource – workstation and server
1997 – Windows NT Version 4

- Began to embraced in the commercial world.


- The same code as Windows NT ver.5
- Refinement and bug fixes as supported plug-and-play devices installation and power management.
- More robust (crashed less often)
2001 – Windows XP

- Known as Windows NT ver.5.1
- Intended to be combination of Windows 2000 and Windows 98.