



Power Computing

This document covers workstation concepts, basic Windows operations and Windows Explorer. The information contained in the following pages is not comprehensive, but is designed instead to illuminate fundamental concepts. This training material may be read and referred to as a separate resource, but it is intended as a supplement to a training presentation for power computing users and potential network administrators already working in a network environment

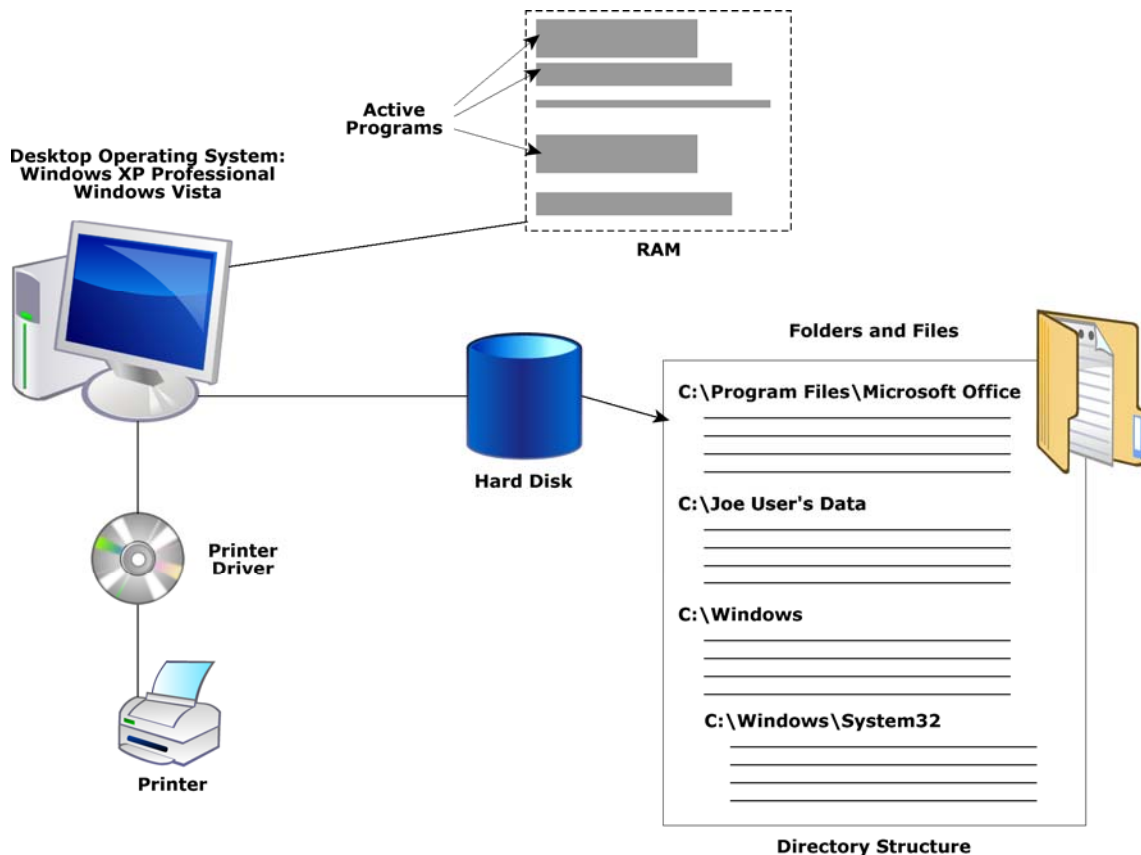
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Standalone Computing - Components Overview



A components overview of standalone computing includes:

Desktop operating system – typically some version of Windows, a group of core programs that provide an enabling interface between the hardware (computer pieces and parts) and software (computer programs such as word processing or Internet browser)

Hard disk - a large, local storage area that contains operating system folders/files and software program folders/files. Hard disk contents are not erased when the computer is restarted or turned off.

Directory structure - the organization of the folders/files on the computer's hard drive(s)

RAM - Random Access Memory, local memory that is used as temporary storage for currently used and recently used programs and files. RAM contents are erased when the computer is restarted or turned off

Printer - a separate peripheral device that receives formatted information from the computer for printed output

Printer driver - a small program that contains device-specific information for a printer. Other devices that use drivers include video adapters/monitors and network adapters.

Standalone Computing - Computer Hardware Components

This is a selective list of the hardware components in standalone computing.

- **Case/power supply** – the case is a plastic/metal enclosure that rests on the floor/desktop and holds the power supply (with fan, that plugs into the wall), and has space for the other hardware components.
- **Motherboard** - a single electronic circuit board that has internal slots for components such as the CPU, memory, and peripheral cards/adapters., and external connections for devices such as USB (Universal Serial Bus) devices, mouse, keyboard, video monitor, and network adapter.
- **CPU** - Central Processing Unit, a single electronic plug-in chip or chip package. The CPU is typically referred to including its manufacturer (the most common are Intel and AMD), model class (Xeon, Pentium etc.) and its clock speed (2 GHz ["gigahertz," which is German for "fast as hell."]).
- **RAM** - Random Access Memory, multiple electronic plug-in chips or chip packages. RAM is typically referred to including its capacity in megabytes (MB), and its "pin" configuration (the configuration of its circuit board packaging).
- **Interface cards/adapters** - single function add-on electronic cards/adapters for special devices such as video monitors, multimedia/speakers, and network communications.
- **Hard disk** - a single device encased in metal packaging that includes multiple drive platters/layers, a drive read/write mechanism, an electronic circuit board, and a power interface. Hard disks are typically internal devices.
- **Floppy disk drive** - a single device encased in metal packaging that includes a drive that can read/write floppy disks, a drive read/write mechanism, an electronic circuit board, and a power interface. Floppy disk drive receptacles are accessible by the computer user.
- **DVD/CD drive** - a single device encased in metal packaging that includes a drive that can read/write compact disks, a drive read/write mechanism, an electronic circuit board, and a power interface. DVD/CD drive receptacles are accessible by the computer user.
- **Mouse** – an input device that connects to an external connector of the motherboard or an interface card/adapter.
- **Keyboard** – an input device that connects to an external connector of the motherboard or an interface card/adapter.

Standalone Computing - Software Components

This is a selective list of the software components in standalone computing.

Desktop operating system – typically some version of Windows, a group of core programs that provide an enabling interface between the hardware and software.

The operating system folders/files may be found in the following typical locations:

C:\Windows

C:\Winnt

Application program - a computer program that performs a certain function or functions. These are common “off-the-shelf” [not customized for any specific use or specific company/person] application programs:

Microsoft Word	Word processing
Microsoft Excel	Spreadsheet, data organization/formatting
Microsoft Outlook	Electronic mail, scheduling
Microsoft PowerPoint	Presentations
Microsoft Internet Explorer	Internet web browsing
Intuit Quicken	Personal financial management
Symantec AntiVirus	Protection from computer viruses

Directory structure - the organization of the folders/files on the computer’s hard drive(s). This structure includes:

Folders/files created and placed during initial operating system installation/configuration.

Folders/files created and placed during application program installation/configuration.

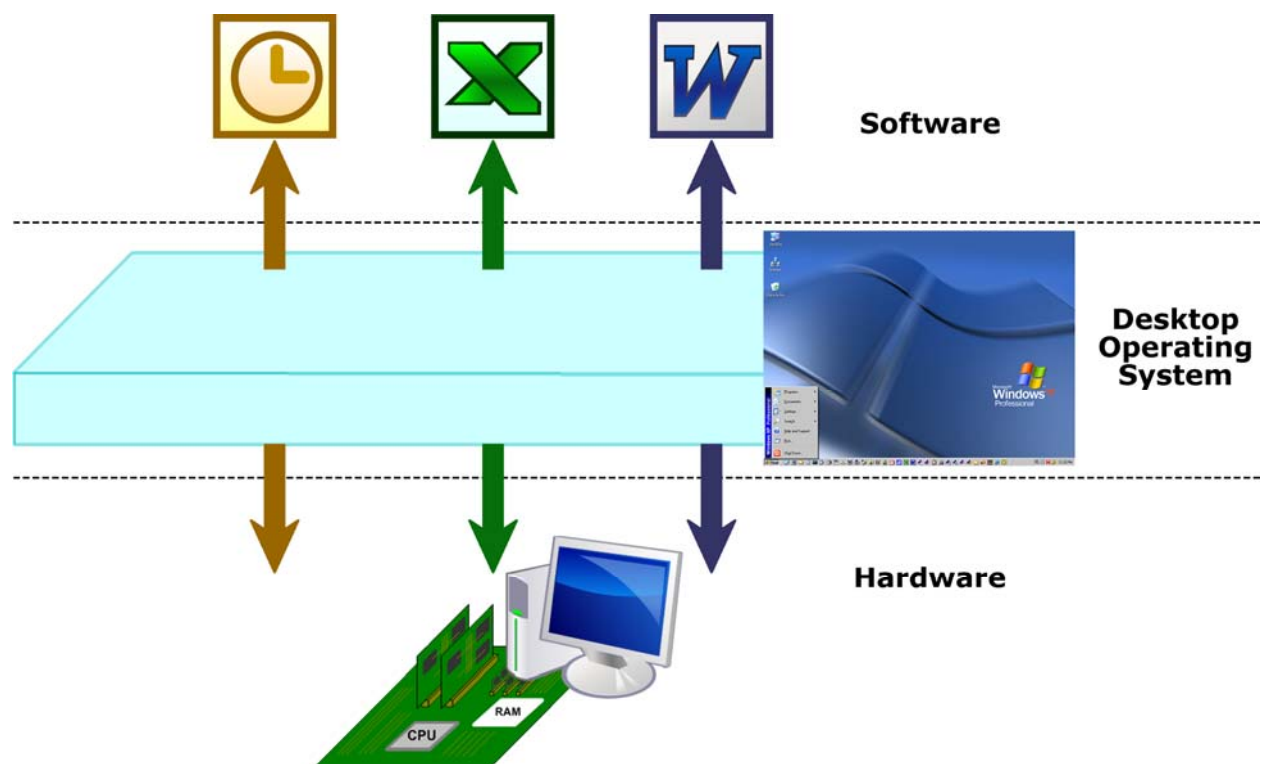
Folders/files for user-created data.

Printer driver - a small program that contains device-specific information for a printer. Other devices that use drivers include video adapters/monitors and network adapters.

Standalone Computing - Desktop Operating System

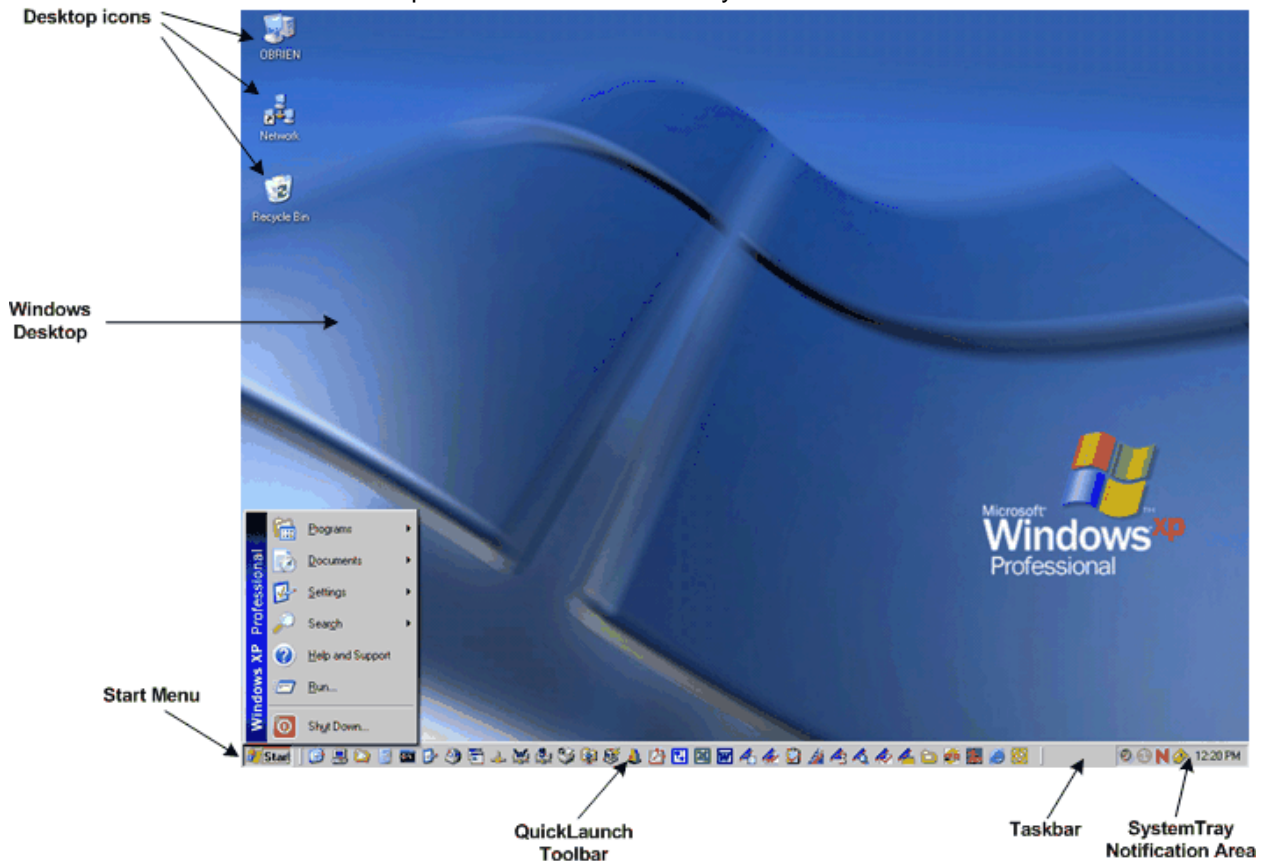
The operating system is a central component of a standalone computing system. As described above, it is typically some version of Windows. Windows is a group of core programs that provide an enabling interface between the hardware (computer pieces and parts) and software.

As diagrammed below, software programs rely on access to the computer through the operating system. A strong knowledge of the operating system and its operations will give you great leveraged knowledge across many of the software programs that the operating system supports.



Basic Windows desktop layout

The Windows desktop is the main interface used to interact with a Windows computer. A sample layout is shown here and a selective list of components is described briefly.



Windows desktop – the main interface to a Windows computer, a container of icons, settings, and objects

Desktop icons - shortcuts to system objects, programs, and files

Start Menu - the main menu for Windows, displays the Windows version; important Start Menu items:

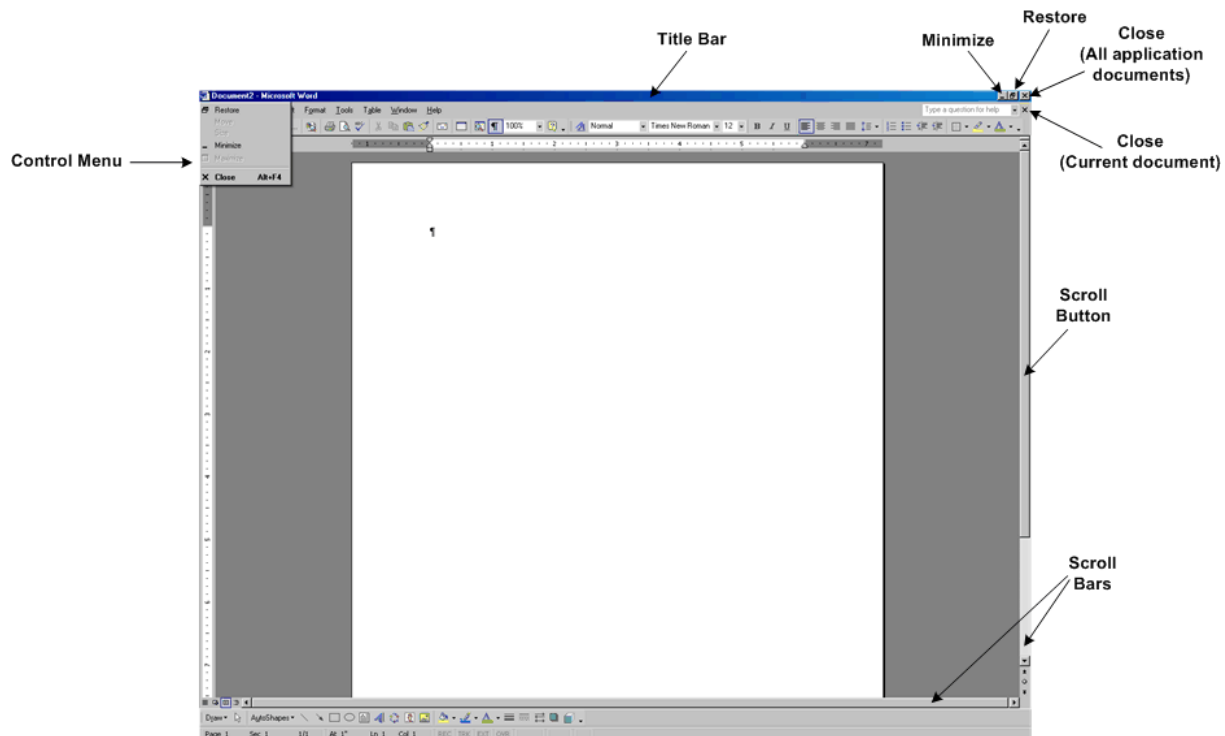
- Run ... Used to launch programs/files from a single command line
- Settings Used to access system configuration: Control Panel, Printers, Network configuration
- Documents Lists most recently accessed files
- Programs Lists installed programs and program groups

QuickLaunch toolbar – user configurable, provides single-click access to programs and files

Taskbar – displays open/running programs, access to Task Manager, open Windows program controls

SystemTray/Notification Area – displays selective system information

Basic Windows Document Windows



Most Windows application programs have a similar basic document window. This is a selective list of the components of a basic Windows document window.

Title bar – displays the application program and document title

Colored more brightly - active window (currently being used); colored less brightly when inactive

Clicking and holding the title bar allows a non-maximized document window to be dragged.

Double-clicking the title bar toggles between maximized/restored to previous window size.

Control menu - displays window sizing commands; single-click the upper left corner of the document window

Sizing controls – displayed in the upper right corner of the document window

Minimize – hides window, accessible via single-click from QuickLaunch toolbar

Maximize – maximizes window to fill entire display

Restore – resizes window to last size

Close (All application documents)– closes current document and all open documents for current application

(e.g., all Word documents, Excel workbooks)

Close (Current document)– closes current document

Scroll button - automatically sized to indicate window scope, controls the horizontal/vertical display

Clicking and dragging the scroll button gives precise control over display placement

Single-clicking the scroll bar on either side of the scroll button moves the display one page

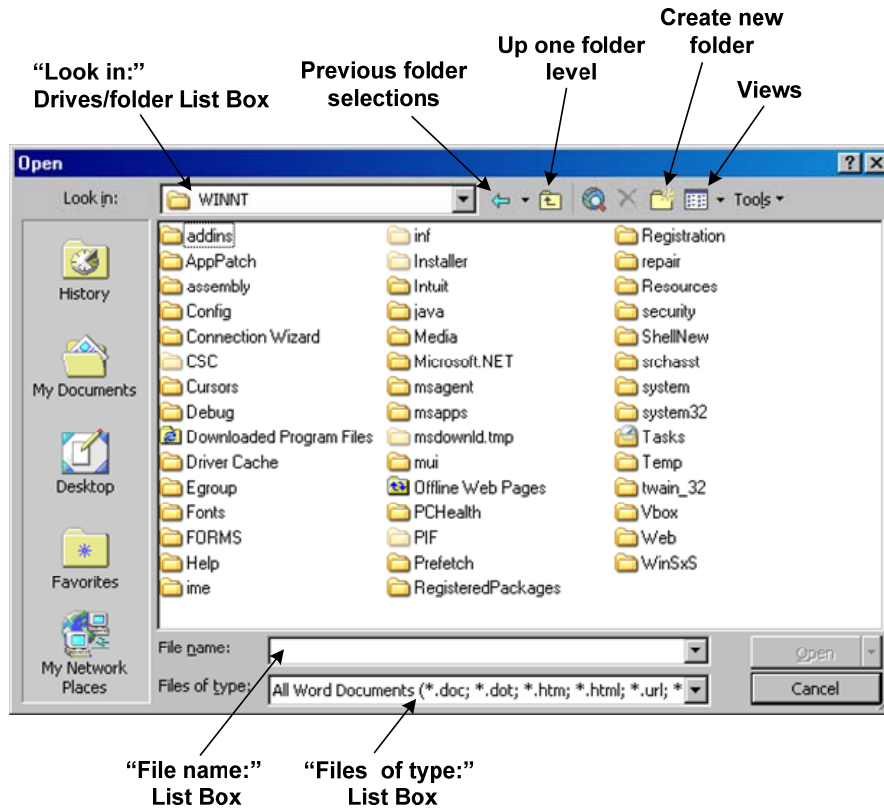
Shift-clicking the end of the scroll bar moves to the beginning or end of the document

Scroll bars - with scroll button, controls horizontal/vertical display

Single-clicking the single arrows at either end gives precise control over display placement

Certain applications provide double arrows at one end for previous/next page navigation

Basic Windows Dialog Box



Most Windows application programs have a similar basic dialog box format. This is a selective list of the components of a basic Windows dialog box.

- **“Look in:” Drives/folder List Box** – displays the local/network drives and folders on the computer; clicking the down-pointing arrow provides a complete list of available drives and folders.
Remember to navigate in order of Drive ... Folder ... and File ...
- **Previous folder selections** – a list of folders previously selected from this dialog box
- **Up one folder level** – a quick way to move up one folder level in the current directory structure
- **Create new folder** – creates a new folder in the currently selected folder
- **Views** – provides viewing choices for the current folders/files, including large/small icons, List, Details, Properties, Preview, and Thumbnails.
- **“File name:” List Box** - any file name you select in the dialog box will be displayed here, or you may manually type in a file name ; clicking the down-pointing arrow provides a list of previously selected files in this dialog box.
- **“Files of type:” List Box** - specifies the type of file(s) to be displayed in the dialog box, identified by their extension (e.g., “.doc” for Word documents, “.xls” for Excel workbooks).

If you don't see a file in the dialog box that you're sure should be there, double-check the “Files of type:”

List Box settings.

Mouse operations



Note: Excellence in both mouse and keyboard operation is the mark of a *true power user*. Become very well grounded in this section's techniques and practice regularly. Experiment with the mouse control settings in Windows Control Panel and customize your mouse operations to maximize navigation capabilities.

The mouse is an input device which, unlike the keyboard, allows you to move freely and quickly around a program's window, select from different menu options, and move through a document or spreadsheet quickly.

The mouse controls the cursor movement on the screen; the cursor is usually in the form of an arrow. When in text editing mode, the cursor usually changes to a text insertion symbol in the shape of the letter I. If you have trouble finding the cursor, try moving the mouse around and watching for the cursor to move position.

The left mouse button is usually used to select items, and the selection is typically done with either a single-click (pushing the button down) or a double-click. Hold the mouse still and rapidly click the left mouse button (once for a single-click, twice for a double-click).

- Making selections with the mouse is done by placing the cursor over the desired item, then clicking.
- When selecting from a dialog box, and buttons are offered (such as Print, Close, etc.), a single click is needed.
- Depending on the Windows display settings, when selecting an icon (program item) in a program group, desktop, or toolbar, either a single click or a double-click is needed.
- When selecting from a menu, move the cursor until the desired item is highlighted, then release the mouse button.
- To move a selection with the mouse, single-click and hold the button down to select and move the item; release the button when the item is where you want it.



Note: The right mouse button is an extremely useful context-sensitive method for determining and selecting necessary Windows and application program functions. Get into the habit of clicking the right mouse button to explore the options available within a portion of Windows or an application program.



Note: The scrolling feature of a wheel mouse allows a power user to navigate quickly and effectively. Familiarize yourself with this powerful feature.

Keyboard operations



Note: Excellence in both mouse and keyboard operation is the mark of a *true power user*. Become very well grounded in this section's techniques and practice regularly. Strong typing skills are a must for the power user.

The keyboard is usually used for entering text and numbers, but in Windows it also can be used to move between Windows, open program menus, make selections from menus, make selections from dialog boxes, and close dialog boxes.

- All Windows programs use Accelerator Keys which, when used in combination with the Alt key, allow for rapid keyboard commands. The Accelerator Keys are denoted with an underline under one of the characters. For example, to open a file quickly, hold down the Alt key and hit the letter F and then the letter.
- Accelerator Keys are common to almost all Windows programs (for example, Alt F+O will perform the File Open command in most programs). Other keyboard commands may be listed in the menu (such as Ctrl. O) that are only applicable in one or a few Windows programs.
- If you hit the Alt key by itself, you may inadvertently activate a control menu for the active window (the control menu is where you would change the size of the window, etc.). To get out of this condition, simply hit the Esc key.

Here is a summary list of some helpful Windows keyboard commands:

Keyboard Command	Function
Enter	An all-purpose "OK"; usually activates the default choice
Esc	An all-purpose "Cancel"; usually cancels/exits/performs "undo"
Spacebar	Toggle dialog box checkbox/selection
Alt. F4	Close dialog box, application program, or Windows
Tab	Move forward to next field/parameter
Shift Tab	Move backward to next field/parameter
Alt Tab	Switch between Windows applications
Home	Beginning of line
End	End of line
Ctrl Left Arrow	Move backward one word
Ctrl Right Arrow	Move forward one word
Ctrl. Home	Beginning of document/file
Ctrl. End	End of document/file
Alt.	Access Keys
Ctrl Tab	Switch between dialog box tabs
Alt Spacebar N	Minimize application program
Alt Spacebar X	Maximize application program
F1 Function Key	Help
F2 Function Key	Edit
F5 Function Key	Refresh

Multiple Windows Program Operations

The most powerful ability that Windows possesses is that of running multiple programs at the same time. If you become familiar with the following procedures, you'll be able to take full advantage of Windows' power.

Cycle between all open programs

- Type Alt+Tab and hold down the Alt key (without releasing it) while hitting (and releasing) the Tab key repeatedly (and slowly). This will cycle you through all open Windows programs in succession, displayed in a small display in the center of the screen. When the program you'd like to use is shown in the small display, release the Alt key and the program will become activated.
- To reverse the order of cycling at any time, hold the Shift key down along with the Alt key. If you are getting a rapid blur of programs being displayed in the center of the screen, let go of the Tab key!!

Toggle between two open programs

Frequently you need to switch between two open programs to copy, move, or simply compare data. By stopping at two open programs using the Alt+Tab procedure described above, you can set Windows to easily toggle between the two programs. You'll still be able to get to the other open programs using either Ctrl.+Esc or the Alt+Tab procedure.

- Type Alt+Tab and hold down the Alt key (without releasing it) while hitting (and releasing) the Tab key repeatedly (and slowly). When the first program you'd like to use is shown in the small display, release the Alt key and the program will become activated.
- Repeat the procedure using Alt+Tab until the second program you'd like to use is shown in the small display, then release the Alt key and that program will become activated.
- You may now toggle between the two programs by holding down the Alt key and hitting the Tab key once, then releasing both the Tab key and the Alt key.
- You may change this toggle feature anytime by Alt+Tab'ing to a program, activating it, then Alt+Tab'ing to a second program and activating it.
- Of course, at any time you may Alt+Tab throughout all of the open Windows programs as described in a previous procedure.

Windows Taskbar operations

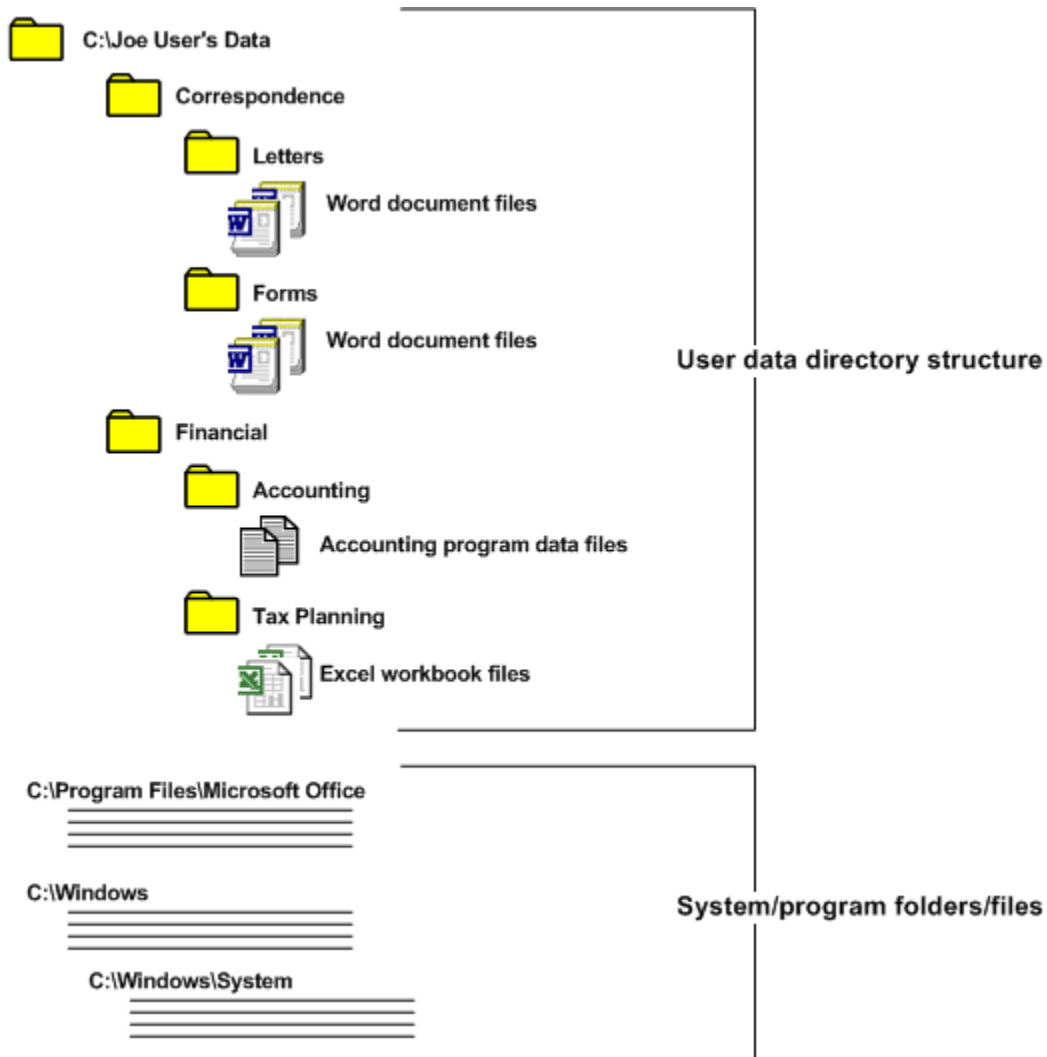
- An effective way to work between multiple open Windows programs is using the Windows taskbar. All open Windows application programs/files are displayed as a single-clickable icon in the Windows taskbar.
- To minimize/maximize/restore an open Windows program from the Windows taskbar, single click it with the left mouse button.
- To close an open Windows program quickly from the Windows taskbar, right-click it and choose Close.

Directory Structure

Creating A Directory Structure

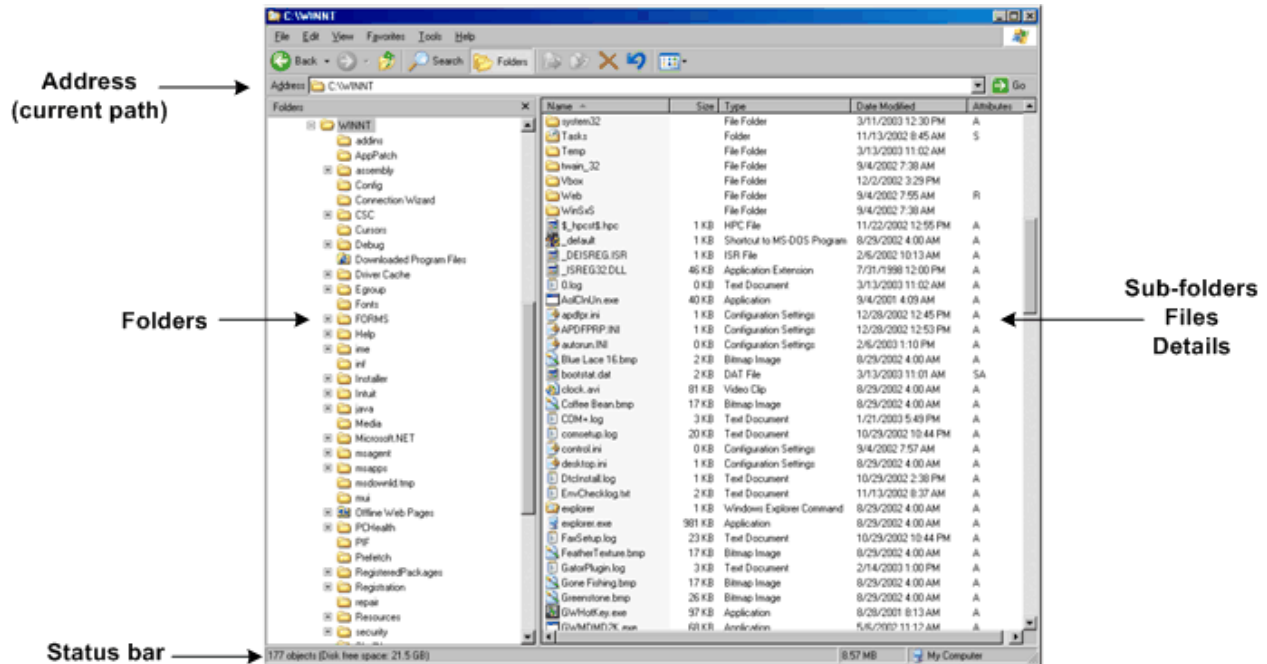
A major step on the road to power computing is to create and maintain a directory structure for your user-created folders, sub-folders, and files. It is important that you organize these items for effectiveness and efficiency. There is no single correct way to do this, but here are some important guidelines.

- Minimize the number of “top-level” folders. Especially in the event of a disaster, when data recovery from backup is required, one (or a small number) of top-level folders with all user-created data underneath these is much easier to maintain than multiple disparate areas on a computer with user-created data.
- Create folder/sub-folder structures by function, rather than application program
- Make top/higher level folder names general (Letters, Accounting), and lower sub-folder names more specific (2002 Church Letters, 1999 Tax Worksheets).



Windows Explorer

A great advantage to using Windows is the ability to easily view the folder and file structure of various drives on your local system and network drives. The Windows Explorer program is the best way to accomplish searching drives, copying/moving files and folders, and setting up a user-defined directory structure.



This is a selective list of the Windows Explorer components.

Address (current path) – displays the currently selected drive and folder path.

Remember to navigate in order of Drive ... Folder ... and File ...

Folders – a list of folders. Folders are containers for files and sub-folders that provide logical and functional grouping.

Sub-folders – the sub-folders underneath the currently selected drive and folder path. Sub-folders provide logical and functional grouping.

Files – the files in the currently selected drive and folder path. A file is the smallest unit of data visible on the hard drive; it may be a system program (or part of one), an application program (or part of one), or a user-created file (a Word document, an Excel workbook).

Details – depending on the options configured for Windows Explorer, a number of folder/file details may be viewed (and are quite useful) such as file size, associated application program, date created/modified, and special system attributes (whether it's a system file, a hidden file).

Status Bar – displays details on the currently selected folder, including the number of sub-folders and files, and available disk space on the drive of the currently selected folder.

Windows Explorer (continued)

Windows Explorer reminders

- As in the Windows Dialog Box, think in this order: Drive, Directory, File.
- The folder that you're working in will be highlighted on the left hand side, and the full path will be displayed in the Address List Box (showing the drive letter and folder path). Double-check your location when creating/copying/deleting files or folders!
- Network drives carry certain restrictions on your ability to view, copy, delete, and rename files and folders. Certain error messages (for example, "disk is full or write-protected", etc.) may occur when these restrictions are encountered. Check with the network administrator to verify your network access rights to files and folders.

Windows Explorer options

Viewing folders and files in Windows Explorer may be greatly altered depending on the options selected. Here are some recommended changes for Windows Explorer power users:

- From the Windows Explorer Tools menu, select Folder Options
- From the Folder Options dialog box:

On the General tab, select "Use Windows classic folders", "Open each folder in the same window" and "Double-click to open an item ..."

On the View tab, make the following settings selections:

Automatically search for network folders and printers	Selected
Display file size information in folder tips	Selected
Display simple folder view in Explorer's Folder List	Selected
Display the contents of system folders	Selected
Display the full path in the address bar	Selected
Display the full path in the title bar	Selected
Do not cache thumbnails	Selected
Show hidden files and folders	Selected
Hide extensions for known file types	Not selected
Hide protected operating system files	Not selected
Launch folder windows in a separate process	Not selected
Show and manage the pair [Web pages] as a single file	Selected
Remember each folder's view settings	Selected
Restore previous folder windows at logon	Not selected
Show Control Panel in My Computer	Selected
Show encrypted or compressed NTFS files in color	Selected
Show pop-up description for folder and desktop items	Not selected
Use simple file sharing	Not selected

Windows Explorer (continued)

Selecting Multiple Files/Folders

- If the files/folders are listed directly next to each other, you may hold down the Shift key while clicking multiple choices. Your choices are highlighted, and the Status Bar displays the number of files selected and their collective size in KB (kilobytes) or MB (megabytes).
- If the files/folders are not listed continuously next to each other, you may hold down the Ctrl. key while clicking multiple choices. Your choices are highlighted, and the Status Bar displays the number of files selected and their collective size in KB (kilobytes) or MB (megabytes).

Deleting Folders/Files

- Right-click on the file(s) or folder(s) to be deleted; choose Delete. You may also select the items (as described in the previous section) and hit the Delete key on the keyboard.
- Note that either of these methods sends the item(s) to the Recycle Bin, which may be restored back to the computer at a later time. To delete an item permanently (bypassing the Recycle Bin and any ability to undo this action), select the item(s), hold down the Shift key on the keyboard, and then hit the Delete key on the keyboard.

Creating Folders

- Choose the location where you want to create a new folder. Make sure you've selected the appropriate drive and location. (The location where the folder will be created will be designated by the highlighted folder in the Folders list box, and will be shown in the Status Bar).
- Right-click an unoccupied space in the target drive/folder, select New > Folder.
- When prompted, type in the name of the folder and click OK (or hit the Enter key on the keyboard). If you make a mistake naming the folder, right-click the newly created folder, select Rename, and enter a new folder name.
- If you are unable to create a folder on a network drive, check with the network administrator for your rights to the drive.

Windows Explorer (continued)

Copying/Moving Files and Folders

- Even for experienced users working with files and folders, copying and moving files and folders requires some care. Pay close attention to the selected folder in the Address List Box and the Status Bar throughout the process to avoid errors.
- Right-click the folder/file that you wish to copy/move (using the item selection steps described in section above) and select Copy or Cut. Note that choosing Cut (unlike Copy) grays out the item(s); if you change your mind (before pasting the item(s) elsewhere), hitting the Esc key will un-Cut an item (or items).

Note: when working with multiple items, the mouse pointer must be over a highlighted item when you right-click or you will de-select your item(s) and will need to begin again.

- Change to the folder where you wish to paste the item(s); remember to double-check that you're in the desired location by looking at the Address List Box entry and the Status Bar. Right-click any unoccupied space in the destination folder and select Paste.

File/Folder names

Even though folders and files may be 255 characters in length, and have a lot of flexibility in their format, it's a good idea to adopt some conventions when naming your folders and files. Many power users use the "intercap" format of using upper/lower case letters for clarity in naming and avoiding the use of any special characters or spaces:

JoesDataFolder
Church2002Letters
1999TaxWorksheets

File extensions

While it is possible to name your user-created files anything you'd like (practically), it's strongly recommended that you maintain the file extension according to the program's conventions. The file's extension is the three character designator following the period at the end of the file name: ".doc" for Word documents, ".xls" for Excel workbooks, for example.

As was seen in the sections above regarding the standard Windows dialog boxes used by Windows application programs, often the only files displayed by default are those with the application program's conventional extensions. Also, when double-clicking a file in Windows Explorer (with the intent of launching an associated application program automatically), that will only work correctly if an application program's conventional extension is being used.

Viewing the properties of an entire folder/sub-folder/file structure

To view the overall properties of an entire directory structure (especially the overall number of folders, files, and hard drive space used), right-click the top-level folder and choose Properties.

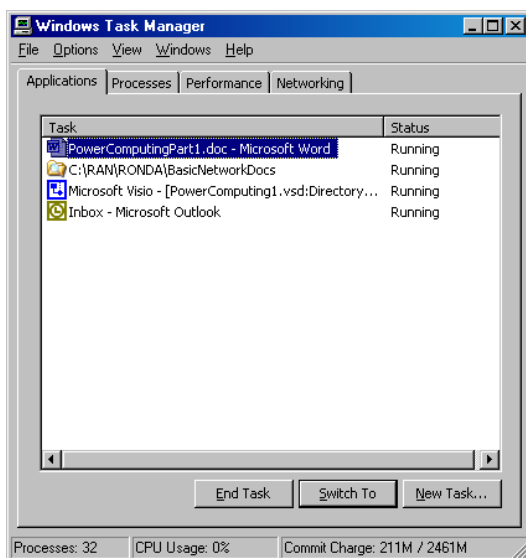
Windows Task Manager

A useful tool for power users to view and control their Windows program operations is the Windows Task Manager. The Windows Task Manager may be very helpful in troubleshooting misbehaving Windows programs and processes, and to view overall Windows system activity.

To run Windows Task Manager, right-click the Windows Taskbar and select Task Manager.

Note: a common, outdated alternative to this method is to press the Ctrl+Alt+Del keys (interrupting the Windows session) and select Task Manager; this is no longer necessary (or recommended).

Applications Tab

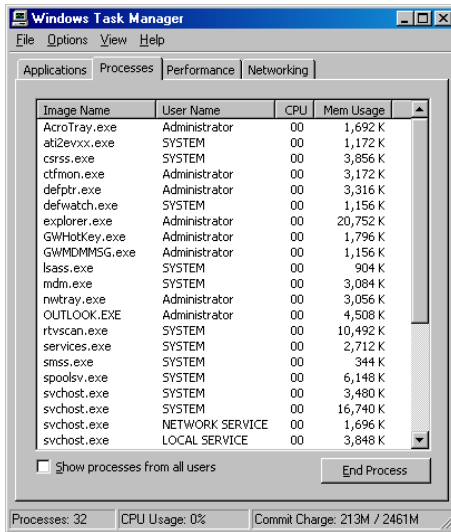


From the Applications tab you may view active Windows application programs.

If absolutely necessary, you may select a program whose status is displayed as “Not Responding” and click End Task.

As a last resort, this will end the application and permit a safe, orderly restart of Windows (the recommended next step).

Processes Tab



The screenshot shows the Windows Task Manager window with the 'Processes' tab selected. The window title is 'Windows Task Manager' and it has a menu bar with 'File', 'Options', 'View', and 'Help'. Below the menu bar are four tabs: 'Applications', 'Processes', 'Performance', and 'Networking'. The 'Processes' tab is active, displaying a list of running processes in a table format. The table has four columns: 'Image Name', 'User Name', 'CPU', and 'Mem Usage'. The processes are sorted by CPU usage in ascending order. At the bottom of the window, there is a status bar showing 'Processes: 32', 'CPU Usage: 0%', and 'Commit Charge: 213M / 2461M'. There is also a checkbox for 'Show processes from all users' and an 'End Process' button.

Image Name	User Name	CPU	Mem Usage
AcroTray.exe	Administrator	00	1,692 K
at2evxx.exe	SYSTEM	00	1,172 K
csrss.exe	SYSTEM	00	3,856 K
ctfmon.exe	Administrator	00	3,172 K
defptr.exe	Administrator	00	3,316 K
defwatch.exe	SYSTEM	00	1,156 K
explorer.exe	Administrator	00	20,752 K
GWHotKey.exe	Administrator	00	1,796 K
GWMDNMSG.exe	Administrator	00	1,156 K
lsass.exe	SYSTEM	00	904 K
mdm.exe	SYSTEM	00	3,084 K
nwtray.exe	Administrator	00	3,056 K
OUTLOOK.EXE	Administrator	00	4,508 K
rtvscan.exe	SYSTEM	00	10,492 K
services.exe	SYSTEM	00	2,712 K
smss.exe	SYSTEM	00	344 K
spoolsv.exe	SYSTEM	00	6,148 K
svchost.exe	SYSTEM	00	3,480 K
svchost.exe	SYSTEM	00	16,740 K
svchost.exe	NETWORK SERVICE	00	1,696 K
svchost.exe	LOCAL SERVICE	00	3,848 K

From the Processes tab you may view active Windows processes, their CPU usage, and their memory usage.

Clicking the heading of any column in the Processes tab automatically sorts the list by that column (in ascending or descending order).

The Processes tab is helpful in displaying which Windows program/process may be consuming too many system resources and causing an overall computer slowdown or performance problem.