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I-Beam Cursor

The I-Beam cursor got its name because the **cursor** itself resembles an I-Beam used in construction. The default **arrow pointer** turns into an I-Beam cursor anytime text editing is needed. If, for example, you click a filename while using the arrow pointer, the cursor changes to an I-Beam cursor so you can enter a new name for the file. The Mac knows when you need an I-Beam cursor and changes to it whenever necessary.

The I-Beam cursor is the default cursor for any application that enables you to enter text.

For example, in Microsoft Word, when you open a new document, the cursor defaults to the I-beam for you to enter text. If you get near the **scroll bars** or **menu bar**, it changes to the arrow pointer so you can make a selection or scroll. The cursor changes back to the I-Beam cursor when your it returns to the page.

See Also

Arrow Pointer; Insertion Point; Menu Bar; Renaming Folders; Scroll Bar; Selection

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Icons

Icons are small pictures or drawings used to represent your **hard disk**, disks, documents, applications, shared volumes, printers, the trash can, and **folders**. If, for example, an icon appears on your **desktop** that looks like a **disk**, that icon represents a real disk in your disk drive, as shown in the figure. To view the contents of that disk, **double-click** its icon with your **mouse**, and a **window** will open showing you the disk's contents. Icons helps you recognize visually that you're viewing a disk instead of reading the name of the disk on-screen. Icons are the basis of the Macintosh interface. They make working with the Mac easier by making it a visual experience.

Apple's drag and drop technology, built-in in System 7.5 and higher, is also utilized with icons. You can take a document, for example, and drop it on top of the application's icon to launch the application and open the document. A number of utilities are designed from the ground up to use drag and drop. Expander (A utility that decompresses Stuffit files), for example, enables you to take a stuffed file, drag and drop it on its icon, causing Expander to launch, unstuff the file, and quit.

The icon that appears on a file is not permanent and can be changed at any time by **copying** another icon (or creating one of your own) and pasting this new icon into the file's **Get Info** box. The Get Info box for a file is found by clicking an icon and choosing Get Info from the File menu (⌘-G). In the

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upper-left corner of this window, the file's icon is displayed. If you click the icon, a box appears around the icon enabling you to copy or paste over the icon. You can paste a new icon over the existing icon by choosing Paste (⌘-V) from the **Edit menu**. When you close the Get Info box, the newly pasted icon appears as the icon for the file.

See Also

Desktop; Double-Click; Disk; Folders; Hard Disk; Mouse; Window

IDE

See

Integrated Development Environment

Idea Fisher

See

Idea Generators

Idea Generators

Before you can write the Great American Novel or even the Great American Business Presentation or Memo, you need one thing—an idea. There's software that can help you find and develop your ideas. Inspiration calls

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itself a “thinking environment.” It helps you visually brainstorm and focus your thinking by providing the tools for you to organize and categorize your ideas. Functioning on the flowchart principle, Inspiration provides 525 different symbols that help you link ideas into relationships. Drag the idea boxes and connectors around on-screen until they make sense, and turn them into proposals, outlines, and charts. Inspiration also includes an excellent outlining program for making hierarchical outlines. You can export your outline to your pet word processor in any of five formats.

If Inspiration helps you take your ideas from point A to point B, then Idea Fisher is what you need when you reach point A with no concept whatsoever. IdeaFisher is based on an IdeaBank of some 60,000 words, organized by categories. You might start “fishing” by looking for an animal, and then moving into the sub-categories: wild/fierce/uncivilized/tame/domesticated/large/small and so on. Entries are cross-referenced by concept and association. You can even free-associate, leap-frogging from one concept to another. The Idea Notepad keeps track of your route through the wordlists, and can export your findings as a text file. You can do a search based on any word or any two words and IdeaFisher will retrieve all of the words (by type) that are related to them in any way.

If that’s not enough to get your own creativity flowing, consult IdeaFisher’s Qbank. This is a list of over 5,000 questions that help you verbalize your ideas, narrow them down, and/or flesh them out. IdeaFisher tabulates your responses to the questions and presents you with a list of words that appear frequently in your answers. There are also special Qbank modules that ask

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questions to help you define and create a mission statement, grant proposal, or speech.

Three by Five, from Mac Toolkit, is a different kind of idea organizer. You make notes on virtual cards and arrange them on a virtual cork board. You also can print the cards on perforated card stock, print them as an outline, or import them into your word processor.

Finally, don't overlook your word processor as an idea generator. Both Microsoft Word and ClarisWorks have powerful outlining tools. Use the Thesaurus to fish for related words as a way of sparking ideas. When you're ready to write the final version, your outline is already in your word processor and only needs some padding to become a full-fledged presentation.

See Also

ClarisWorks; Microsoft Word; Three by Five; Word Processors

IEC

Founded in 1906, the IEC (International Electrical Commission) is a result of a resolution passed at the International Electrical Congress held in St. Louis in 1904.

Commission's object is to promote international co-operation on all questions of standardization and related matters in the fields of electrical and

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electronic engineering and thus to promote international understanding.

The IEC is composed of National Committees, of which there are presently 51, representing all the industrial countries in the world.

Ignore Internal Disk (Keyboard Shortcut)

You can ask the Mac to ignore the **internal disk** by holding down the ⌘-Option-Shift-Delete keys while you **boot** your computer. This makes the Mac ignore the internal disk and search through the **SCSI chain** for a disk to startup from. When it finds a disk with the startup files, it starts up from that disk. This disk does not mount on the **desktop**.

See Also

Boot; Desktop; Internal Disk; Keyboard Shortcuts; SCSI Chain

Igor Pro

See

Charting and Graphing Applications

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Illustrator

Standing at the top of the draw program heap along with **Freehand**, Illustrator is a sophisticated **PostScript drawing application** that's suitable for creating everything from simple black-and-white line drawings to complex color images.

Like most drawing packages, Illustrator offers more than one way to get shapes on the screen. There are rectangle and circle tools for drawing simple shapes, polygon tools for making polygons, stars, swirls, and spirals, and a Freehand Sketch Tool for creating free-form shapes. A pen tool creates **Bézier curves**, the basic element of PostScript draw programs, while a pressure-sensitive brush tool (unusual for a draw program) works like a paintbrush or calligraphy pen, making broad strokes.

All Illustrator objects have a stroke (border or line) and a fill, both of which can be black, white, colored, or transparent. Objects can also be colored with gradients of multiple colors shading from one to the next, either linear (in a straight line) or radial (radiating out from a center point). Patterns, either built-in or created by the user, can also be used to fill objects.

Color-keyed layers allow objects to be hidden, stacked, and reordered easily, while masking tools allow users to show only that portion of an object that falls within the borders of the masking object.

Illustrator's graph tool simplifies the creation of graphs; it can import data from spreadsheets or text files—or use data entered directly by the user—to

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create one of six different types of graph. Graphic elements can be used in graphs (stacked up to make columns in a bar graph, for example), and once the data is finalized the graph can be unlinked from its data and customized with Illustrator's drawing tools.

Bitmapped images in several formats (including **TIFF**, **EPS**, and **PhotoCD**) can be imported into Illustrator documents and traced or even edited using **Photoshop plug-ins**, and 1-bit (black and white) TIFF images can be colored. **Vector graphics** can be rasterized (converted to **bitmapped images** in **RGB** or **CMYK** format) within Illustrator.

Text support is strong in Illustrator, with the single exception that the program lacks **text style sheets**. Floating palettes allow easy access to character and paragraph attributes, and plug-ins allow text to be spellchecked and searched. Like most PostScript draw programs, Illustrator can convert text to editable outlines.

Implementation of the **add-on software** concept is particularly strong in Illustrator, with a wide variety of plug-ins designed for the program and the ability to use Photoshop plug-ins and Freehand **Xtras** as well. Perhaps the most powerful plug-ins Illustrator comes with are the Pathfinder filters, which allow users to perform a number of different functions on multiple paths, such as combining two paths to make one large one, creating a third path out of the intersection of two objects, and cutting an object into multiple paths defined by where another path crosses the object.

See Also

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Add-On Software; Bézier Curves; Bitmapped Images; CMYK; Drawing Application; EPS; Freehand; PhotoCD; Postscript; Photoshop; Plug-Ins; RGB; Style Sheets; TIFF; Vector Graphics; Xtras

IMA

IMA (Interactive Multimedia Association) is a standard format for compressing audio. A 16-bit (stereo) sound compresses at about 4:1 with almost no detectable sound degradation. Certainly, it's much better than **downsampling** the sound, which is an alternative method of reducing the size of sounds. IMA increases the amount of sound you can store, and reduces the data rate required to play the sound, although the decompression routines themselves take up processor time and might not perform well on slower Macintosh computers.

QuickTime 2.1 and **Sound Manager 3.1** support IMA sound compression for **AIFF** files. To create an IMA sound, open the sound in a program, such as **MoviePlayer**, and choose Export from the File menu. A dialog opens asking you to specify the name of the exported file and what you want to export to (choose AIFF file). Click the Options button and choose IMA from the Compression menu. Save the file. The resulting file is saved as an AIFF file that can be opened and played by any application that supports AIFF files, provided Sound Manager 3.1 is present on the machine being used.

An IMA-compressed AIFF file is not supported on a Windows computer. If you

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are creating a cross-platform sound to play under Windows, you should open the AIFF file again in MoviePlayer and save it as a QuickTime movie. This will then play on the Windows platform under **QuickTime For Windows** . You should test your sounds on several computers to make sure that they play satisfactorily under Windows.

Image Compression

One of the biggest problems in working with electronic graphics files, particularly **bitmapped graphics** , is their size. As the images become more and more detailed, their file size balloons—in fact, many graphic designers don't care about being rich or thin; from their point of view, you can't have too much RAM or too big a hard drive.

Compression programs like **StuffIt** or **DiskDoublor** work on any files, reducing their size to save space. But many graphics file formats have their own built-in compression schemes. These can be divided into two categories: lossy and lossless.

Lossy compression schemes cause image deterioration when used. Depending on the image and the amount of compression, the deterioration may not be noticeable, but it's there. Lossless compression schemes can't compress images as much, but they don't remove any image data, so they don't affect the quality of images.

File formats with their own compression schemes include **TIFF** (LZW, a

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lossless scheme), **GIF** (which also uses LZW), and **JPEG** (lossy). Many Mac graphics applications can also save to BMP files, a PC format that uses the lossless RLE compression.

See Also

GIF; JPEG; TIFF

Image Distortion

See

Monitors, Image Quality

Image Manipulation for Printing

If a digitized image requires adjustments of any kind after it has been scanned, an image manipulation software application must be used. For Macintosh computer users, **Adobe Photoshop** is the only software of this type available, and it has become the desktop publishing industry standard. Many desktop scanner manufacturers provide plug-in software that enables their equipment to be operated from within Photoshop. Photoshop provides many tools for manipulating the scanned image. An image may be output directly from Photoshop or saved in a format that is compatible with page layout software applications or **PostScript** drawing programs. The following are typical and practical concerns when preparing a scanned image for

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printing.

File Format— (File Menu/Save As)—Photoshop has the capability of saving a digitized image in many different formats. The purpose of saving an image in a file format other than Photoshop's native format is to make the image compatible with other software applications. Images to be imported into electronic page layouts should be saved in EPS (Encapsulated PostScript) or TIFF (Tagged Image File Format). TIFF seems to be favored for images imported into **Adobe PageMaker** or **QuarkXPress**. Both of these applications accept images in other formats, but TIFF is excellent for output to PostScript devices, especially if color separations are to be done. When working with a service bureau, trade shop, or printing firm, it is wise to ask them which file format is best for their equipment. TIFF images may be compressed by Photoshop to create smaller file sizes (LZW Compression). Check with your output service provider before applying any compression to TIFF images in Photoshop.

Mode Change— (Mode Menu)—Continuous-tone color images appear in RGB mode in Photoshop unless they are converted to CMYK. High-end scanners can work in CMYK, but most desktop scanners use RGB. Black and white continuous-tone images normally appear in Grayscale mode. Both types of images become halftones if they are printed on a printing press, but it is not necessary to convert them to that mode in Photoshop. It is, however, desirable to convert RGB images to CMYK before performing any production work such as sharpening, contrast adjustments, ink setup, and so on because the image must be converted to CMYK to be printed. Although color display

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may not accurately reflect the final printed colors, it is still a good idea to perform all adjustments in the CMYK mode.

Image Size and Resolution— (Image Menu/Image Size...) If an image was not scanned at the proper resolution or scale, the image's measurements can be altered in Photoshop's Image Size dialog box, as shown in the following figure. If the image needs to be resized or the resolution changed in Photoshop, the File Size constraint checkbox should be unchecked. This process is called resampling. Because file size, image size, and resolution are directly related to each other in a bitmapped image, removing the File Size constraint enables Photoshop to maintain the same resolution of an image when it is enlarged or reduced. Under this condition, Photoshop makes new pixels when the image is enlarged (sampling up) and discards pixels when the image is reduced (sampling down). Similarly, if the resolution number is changed with the File Size constraint removed, Photoshop can maintain the same image size. In both cases, the size of the file changes to reflect the addition or removal of pixels. Changing the image size or resolution without removing the File Size constraint results in a degraded image.

Image Adjustments— (Image Menu/Adjust) The controls in Photoshop's Adjust submenu enable an image to be adjusted for tone, brightness/contrast, and color. Tone corrections are usually carried out in the Curves dialog box (as shown in the following figure) and color corrections in the Hue/Saturation dialog box (**** see Figure P12BP). Brightness and contrast should be adjusted in the Levels dialog box (see Figure P13BP). Most experts advise against using the Brightness/Contrast dialog box because its

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adjustments are too global and tend to allow highlight tones to drop out entirely and shadow tones to become too dark.

Sharpening— (Filter Menu/Sharpen) The sharpening filters do what their names imply. They work by increasing contrast between adjacent dark and light pixels, particularly along clearly defined edges. The Unsharp Mask filter is recommended because it provides more control than the others. In the Unsharp Mask dialog box, shown in the following figure, the Amount setting controls the overall effect of the filter. Because every image is different, it is difficult to recommend an exact percentage for the Amount setting; however, a higher number creates a more exaggerated effect than a lower number. The Radius setting in the Unsharp Mask dialog box determines the radius of the halo of pixels that will be affected by the filter, especially along edges. If the setting is too high, the halo created around edges may be noticeable. A setting of 0.5 to 1.2 is conservative. Finally, the Threshold setting tells the filter which pixels in the image to adjust. A low number, such as 0, enables the filter to affect nearly all the pixels in the image. Higher numbers restrict change to only the most discernible edges. The default number is determined by the image itself. Try a Threshold of 5 and work up or down from that number. One of the reasons Unsharp Mask is favored by many experts because its effects are subtle, and it takes a sharp eye and some experience to arrive at the optimum settings. You should experiment with an individual image to achieve the desired results.

Cloning, Cropping, and so on. — (Tool Palette) The tools in Adobe Photoshop's Tool Palette are used to manually alter images and create new

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images. Images may be retouched and altered significantly with the Cloning Tool. Because it copies existing pixels and duplicates them in an adjacent area of the image, the Cloning Tool is useful in removing unwanted background objects or flaws. Cropping is an effective way to enhance the visual impact of an image or remove unwanted objects showing at the edges. Many other alterations may be performed directly on the pixels of the image, but Cloning and Cropping are the two most commonly performed actions.

Printing Ink Setup — (File Menu/Preferences/Printing Inks Setup) When printing an image directly from Photoshop, this dialog box targets a specific printer, enabling the program to set an appropriate compensation for **dot gain**, as shown in the following figure. Gray balance can also be adjusted here. Gray balance is the amount of cyan, magenta, and yellow necessary to create a neutral gray. Because process ink colors are not pure, correction must be done to produce grays that are truly neutral. A correct gray balance is necessary to produce good color separations. Changing the gray balance settings in Photoshop is seldom necessary, and a novice user should not tamper with this without consulting the prepress or printing service provider.

Color Separations — (File Menu/Preferences/Separation Setup) An image must be converted from RGB to CMYK to be color separated for printing. The Separation Setup dialog box (shown in the following figure) controls the conversion in Photoshop and provides settings for how ink is applied to the paper. The choice between **GCR (Gray Component Replacement)** and **UCR (Undercolor Removal)** determines how black ink is applied in

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relation to the other three process colors (cyan, magenta, and yellow). As in the case of gray balance, these settings are not an appropriate area for experimentation, and selections should be made under the advice of an experienced printing technician.

See Also

Color Printing; Color Separations; Digital Halftones; GCR (Gray Component Replacement); Halftones; Image Scanning; Ink Trapping; Process Color; UCR (Undercolor Removal)

Image Registration

See

Color Trapping

Image Scanning

Most continuous-tone images printed in publications are generated with a scanner, although digital cameras are gaining in popularity. Except in the case of expensive, high-end digital cameras, scanners still create better digital images. Photographs are the most common form of continuous-tone image, and they may be scanned as film negatives, as transparencies, or as photographic prints. When a photograph or other continuous-tone image, such as a pencil drawing or watercolor painting, is scanned, it becomes a

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digital image called a bitmap. Even black and white images (line art) are frequently scanned. Bitmapped images are characterized by a certain number of pixels per inch and a certain number of bits per pixel. Both of these characteristics are resolution factors and are determined when the image is digitized by the scanner. Perhaps the most important factor in scanning is the quality of the original image. Even the magic of **Adobe Photoshop** cannot compensate for poor original image quality.

Most scanners use a special computer chip called a charge-coupled device (CCD) which contains an array of light-sensitive elements . The CCD array converts photons (light energy) into electrons (electrical energy) processed in the computer as binary data. This results in pixels containing varying degrees of color or grayscale information depending on the capability of the system. The final printed form of a bitmapped image is usually a halftone, and to create the best halftone images, a scanner must store multiple bits of information in each pixel. Grayscale images must have eight bits per pixel, resulting in 256 potential levels of gray per pixel. (The **PostScript** page description language supports no more than 256 levels of gray. PostScript Level 2 supports more gray levels, but it is said that the human eye cannot perceive more.) High-quality digital color images require 24 bits per pixel to provide a potential 16.7 million colors. This number derives from multiplying the 256 shades in each of the colors of the additive system (RGB)— $256 \times 256 \times 256 = 16,777,216$. This type of color resolution is called bit depth or pixel depth.

The other type of resolution in a bitmapped image is the number of pixels per inch (ppi). This is also established when the image is digitized, but it can be

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altered later by resampling the image in Adobe Photoshop or some other image manipulation application. The optimum number of pixels per inch can be determined if the screen frequency of printed halftones is known. If no image enlargement or reduction is planned, multiplying the halftone screen frequency (lpi) by a factor of 2 or 1.5 provides the best scanning resolution in ppi. See the "Digital Halftones" entry for more information on scanning for halftones. As a rule, it is better for an image to have a higher than necessary resolution than one that is too low.

Although desktop flatbed and film scanners can produce high-quality images, the best scanning quality is obtained with drum scanners. Drum scanners have actually been in use since the 1970s, somewhat before the desktop publishing revolution. A drum scanner is often part of a proprietary **CEPS (Color Electronic Prepress System)**, representing the high end of desktop publishing. Generally, drum scanners are faster and have greater dynamic range than desktop scanners. They may be capable of digitizing images in CMYK mode with a pixel depth of 32 bits and linear resolutions of 2,000 ppi and more. Of course, they also are much more expensive. Lately, less expensive desktide drum scanners have been marketed, but they are not yet as ubiquitous as the desktop flatbed or film scanner.

The best desktop scanners are capable of 24-bit color and 256 levels of gray. The goal of scanning for print production is to provide images that make good **halftones** and good **color separations**. The quality of the light source, the sensitivity of the CCD array, the accuracy of the optical system, and sensitivity to **highlight points** and **shadow points** all determine a

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scanner's **dynamic range** and therefore affect image quality. Density range (the range of values between the darkest and lightest points) is a primary concern when scanning. Most scanning software adjusts for density range, but it can be done manually by sampling a prescan image. Based on this highlight and shadow point information, a tone curve is established for the image. In effect, color separations must compress a fairly wide tonal range of color into a relatively narrow tonal range that can be achieved on a printing press. Mathematical algorithms in software such as Adobe Photoshop determine the proper tone compression based on the original tone curve.

See Also

Color Resolution; Color Separations; Digital Halftones; Dynamic Range; Image Manipulation for Printing; Resolution Measurement

Imagemaps, Creating

An imagemap or clickable map is an image that has been set up to act as a map; that is, every pixel is assigned coordinates. Clicking specified areas in the image sends the cursor coordinates to a **server**, which sends the user to a file in another location.

A map is a picture broken into zones. Each zone has its own **URL** or **Internet** address: a new page, a close-up of the picture, and so on. When the user clicks inside the predefined zone, a link is made to the corresponding

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URL.

Clickable imagemaps commonly appear on World Wide Web sites. They take advantage of the Web's ability to present information graphically by providing a visual means of accessing parts of a Web site.

A number of different software packages can be used to create an imagemap. These include WebMap, Mac-ImageMap, MapServe, or MacMapMaker.

The techniques can vary depending on what sort of software your Web site uses to serve documents on the Web: NCSA or CERN server software are among the most popular. The basic steps, though, are common to both NCSA or CERN servers:

1. Create an image that will serve as an imagemap by drawing or scanning it, or buying it from a commercial clip art package. The image should have well-defined boundaries and stand out clearly from its background. The map shown in the following figure contains clickable regions that are easy to define, such as circles and rectangles.
2. Define the clickable regions of the image by using a program such as WebMap. To do this, you open up your already-saved GIF image within WebMap and use WebMap's drawing tools to create clickable region in the shape of a circle, square, or polygon by drawing them "on top" of your image.
3. Determine the x,y coordinates of region you have created. (The 0,0

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point is at the top left-hand corner of your image.) Each region you draw is assigned x,y numbers describing its boundaries. Depending on how many of these regions you draw, you will wind up with a list of these regions and coordinates. That list is called an *imagemap configuration file*. Any user who clicks within the boundaries of a particular region will be taken to a file you assign to it.

4. Set up the destination file for each of the clickable regions on your server. You may have several region pointing to the same URL, but each region can only one destination.
5. Enable a Common Gateway Interface (CGI) program to carry out the actions specified in your Configuration File. You will probably have to change a line in the CGI code to enable it to recognize both your imagemap and your configuration file.
6. Test, correct, and retest until you are sure all the links work correctly before putting your map on the Internet.

Complicated imagemap images often result in maps taking a long time to load on-screen. When the map graphics don't consume a good deal of disk space and the map itself is uncrowded, clickable maps are a useful way of hyperlinking in one place many separate document and other elements scattered throughout a Web site.

Because imagemaps can be so complicated, though, the map creator should ensure that data is processed as quickly and efficiently as possible. The steps

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mentioned previously describe a server-side imagemap, where the processing of map file is done on the remote server. A relatively new kind of imagemap, the client-side imagemap, accomplishes the goals of speed and efficiency.

See Also

Client, Imagemaps, Server-Side versus Client-Side, Server

Imagemaps, Server-Side versus Client-Side

The difference between client-side and server-side imagemaps is in how the link is made to the corresponding URL when the user clicks a map.

A server-side imagemap is identified in an HyperText Markup Language (HTML) document by adding the <ISMAP> attribute to the IMG tag:

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<IMG SRC="URL_for_map_image.gif" ISMAP="map.html#map1">
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In this line of HTML, identifies the graphic that represents the map that the user sees onscreen. <ISMAP> identifies the map file[em]the document that defines clickable areas on the graphic ad associates them with separate HTML documents.

With server-side imagemap, the mouse click causes information to e sent to the remote Web server that contains the original map and all the document

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associated with it. the information is processed by the CGI program on the server's machine and the new document is sent to the user's **Web browser**.

With **client** -side imagemaps, all the important information about the map is transferred to the user's computer by the remote server, and the client computer does all the work[em]after all, the client machine isn't busy responding to hundreds or thousands of hits, as the server might be. the information to e transferred is embedded in the HTML document that contains the map. client-side imagemap respond much quicker to mouse clicks, work more efficiently, and are more secure for the map creator.

See Also

CERN, Client, CGI, GIF, HTML, Imagemaps, Creating, Internet, Server, URL, Web Browser, Web Site, World Wide Web

Imagesetters

The imagesetter is a prime piece of equipment at a **desktop publishing service bureau**. In fact, many service bureaus evolved directly from typesetting services where imagesetters were part of the phototypesetting equipment. In the mid 1980s, Linotype Corporation (now Linotype-Hell) began adapting their Linotronic brand of typesetting imagesetters to output desktop computer files through a **PostScript raster image processor (RIP)**. Consequently, the brand name Linotronic became as common as Kleenex or Xerox. Even now, the expression "to Lino" is associated with high-

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resolution output of any kind.

Imagesetters provide high-resolution output by using laser beams to expose images on photosensitive paper or film. Some imagesetters can even expose images directly on printing plates. Imagesetters are really a system of components rather than a single device. The three main components are a raster image processor (RIP), an imager, and a photo processor. Some imagesetters require typical photographic developing chemicals, but some newer devices utilize a dry thermal process that is much more environmentally friendly.

The raster image processor (RIP) is responsible for interpreting PostScript data and converting it to high-resolution bitmaps. The RIP is usually a piece of hardware, but software RIPs also exist. The imager, also called a recorder, is the largest piece of equipment. It uses laser light to expose tiny laser spots on the photosensitive imaging surface, combining the spots to create halftones and line art. The dots per inch (dpi) rating of an imagesetter actually refers to the laser spots. These are also sometimes called machine spots by technicians. These dots (or spots) are only 5 to 30 microns in diameter. Smaller dots mean higher resolutions in dots per inch. After the image has been recorded on the photosensitive paper, film, or plate, the output medium is developed in the photo processor. Of course, fresh chemicals and proper handling are crucial during the development process.

See Also

Digital Halftones; Gray Levels; Prepress; Raster Image Processor; Service

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Bureaus, Trade Shops, and Desktop Publishing

Imagination Express

Kids typically can invent, imagine, and create wonderful stories, but their lack of skill with illustration and text editing often slows them down or inhibits their writing efforts. Edmark has found a solution with its Imagination Express series. These programs provide the artwork, sound effects, and other tools to help kids create interactive stories and movies. There are four destinations in the series, with more to come.

Each of the four—Oceans, Rain Forest, Neighborhood, and Castle—includes a set of backgrounds, and a “cast” of characters and props to help kids tell the story. The actors and props come in the form of electronic “stickers”, which the child simply drags to the background. Most have sounds attached, and many also have movement. To animate a fish, for example, the child places the fish in its starting position, clicks the camera icon, and then drags the fish where it’s going.

There are sound tools that enable kids to add their own sounds and narration to the stories, as well as choosing from a pre-recorded collection of theme music and sound effects. When the creation is done, kids can print their storybooks in black and white or color, or display their movies to family and friends on-screen. The Rain Forest, Ocean, and Castle modules also include on-screen “fact books” with information that kids can use in their stories.

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Immedia

Immedia is proprietary publishing format and browser from **Quark**, the developers of the desktop publishing program **QuarkXPress**. Immedia uses proprietary format files and a custom **World Wide Web browser** that can be used as a stand-alone program or as a plug-in for programs, such as **Netscape Navigator**. Data formats supported include text, graphics, video, and audio. The developers claim that Immedia will offer more sophisticated typography and layout than is supported by **HTML** and current browsers. At the time of writing, this product has not been released.

See Also

QuarkXPress, World Wide Web

Import/Export, Spreadsheet

Most **spreadsheets** can save or open their pages in a variety of formats to match other spreadsheet programs, and almost all are compatible with **Microsoft Excel**. Spreadsheets also let you import or export just their data without **formulas** as **text files**, with tab or comma characters between each **column** in a **row** and return characters at the end of each row. You'll find this handy for moving data between a spreadsheet and a **database manager** or **word processor**.

There's also a universal language, **SYLK** (for Symbolic Link), spoken by all

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spreadsheet programs. It creates a text file that preserves data and formulas, and any formatting you might have applied to the cells. Like its word-processor equivalent **RTF**, it's not very efficient—a small spreadsheet file becomes a very large **SYLK** file—but because it's completely text-based, it can be used **cross-platform** and sent over **email** systems.

Importing CD Audio

See

CD Audio

Importing Graphics

See

Referencing

Imposition

See

Prepress, Printing Terms

Improving a Performa's Picture

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To fix the Trinitron Picturtube that comes with the **Performa** , open the **Monitors Control Panel** in the **Control Panels** folder and check Uncorrected Gamma, causing your screen to become much sharper.

See Also

Control Panels; Monitors Control Panel; Performa

IMS

See

Internet Multicasting Service

Inbetweening

Used in animation programs, inbetweening is a process of automatic motion creation. The software enables you to define a starting and ending point for the movement of an object. These are called the **key frames** . Using the inbetweening routines, the software calculates the location of the object during the motion. This can be as simple as dividing the number of frames by the distance the object travels, and evenly spacing the motion over the sequence. Most programs (including Macromedia's **Director** and Specular's **Infini-D**) enable you to define acceleration after the first key frame, and deceleration before the next key frame, enabling more realistic movement.

See Also

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Key Frames

In Control

In Control, from Attain Corp., is a planner and organizer, rather than a full-fledged PIM. It combines a calendar and outliner. The outliner, which makes and prioritizes to-do lists, can be viewed with or without the calendar page. Because it lacks the contacts file typically found in PIMs, the same company sells its own contact manager, FastPace Instant Contact. Like the **Now Up-to-Date/Now Contact** bundle, this one is well integrated so that it's easy to link information from one program to the other. The area in which In Control really shines, though, is in making to-do lists. The outliner encourages you to think of your tasks in a hierarchical order, which not only helps you set priorities for them, but also forces you to see which are dependent on other things that must happen first. Suppose, for example, that you're using In Control to plan a dinner party for a large group. When you begin listing tasks, you'll see right away that you can't send the invitations until you've set the date and confirmed the caterer and facilities.

Lists can be customized with the dates on which tasks must be accomplished and who's responsible for doing them, or with any other qualifications you choose to apply. The structure of the program lends itself to refining details. You can add as many columns or categories of information as you want. Then you can sort the outline by priority, due dates, people assigned to the various tasks, or any order you find useful.

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The calendar shows the month or a single day. The day view plans your schedule in half hour increments. The month view can be expanded to two weeks, or reduced so that you can see several months (up to twelve) at once. Date and time entries in the outliner are automatically entered on the appropriate calendar pages.

In Control can be shared across a network, while keeping some entries private. Connecting to the Public File, directly or via **Apple Remote Access**, on the workgroup server will automatically update each user's "local" files. You can choose how much of your data to share—which outline columns are to be kept private and which are available to coworkers. Further refinements are also possible. You might choose to share certain kinds of data, such as salaries or performance reviews, with some people but not with others. In Control is a flexible, powerful tool for managing your time and information, and you don't need to be a control freak to use it.

See Also

PIMs

Incremental Backup

An incremental backup is **backing up** only the files that have been altered or edited since the last time you backed up the contents of your **hard disk**. If, for example, you backed up your hard disk on Tuesday and on Wednesday you worked on 14 different files, you don't need to back up the entire hard

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disk again—just the 14 files you've edited. Backing up these 14 files is an incremental backup.

There are third-party utilities that do an incremental backup for you, or you can do it manually. To manually do an incremental backup, use the **Find command** (⌘-F) at the **desktop**. When the **Find dialog box** appears, click the **More Choices** button. Then select **Modified Date** from the **pull-down menu**, type in today's date, and press **Find**. This brings you all the files that you changed today, enabling you to **copy** these files onto your backup disk(s) to complete an incremental backup for the day.

See Also

Backing Up; Copy; Desktop; Dialog Box; Find Command; Hard Disk; Pull-Down Menu

Index, Creating

An index is an alphabetical list of topics in a document and the page numbers on which they can be found. Not all word processors or desktop publishing programs are capable of creating an index, but the more “serious” ones such as PageMaker, QuarkXPress, WordPerfect, and Microsoft Word have indexing functions built in. Each program handles indexing somewhat differently, but the general principles are similar. Indexing is done by means of an index dialog box that (unlike most dialog boxes) remains active while you enter text or scroll through existing documents, so that you can mark multiple entries.

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Click the button, or hit enter to mark the selected entry.

When you reach a word in the text that is to become an index entry, simply select it. It will be automatically entered in the Main entry field. To mark it, click the button. This places a non-printing tag next to the word. “Mark all” will locate every instance of that word in the document and automatically place tags next to all of them. Once you have marked all of your index entries, use the Index and Tables box to select a style for the index.

Choose an appropriate style or design your own.

The program will collate all of the marked entries, sort them, and create the index as a separate section following the document. Sub-entries and cross-references are handled from the Mark Index Entry box, too, and are collated into the index at the same time. Once the index is assembled, it can be edited, but changes will disappear if the index is then re-collated.

Indexing

See

Long-Document Management

Indiana Jones Desktop

See

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Hollywood Games Connection

Infini-D

Infini-D sports a four view interface (top, front, side, and camera view). other views can be added when necessary. Window sizes can be customized for size and application (NTSC, Small, Quicktime...) and number of colors. background images are shown in the camera view. Any view selected can be instantly rendered (Wireframe, fast, better, best) with no anti-aliasing, medium, or high applied. When editing, it's best to leave rendering set to wireframe to conserve time. Preview renders can be generated whenever necessary. Selected objects can be manipulated visually from ToolBox icons or from numerical equivalents in the floating Object Menu. Object translations in the view windows are instantly updated in the Camera window, and vice versa.

Modeling Tools Infini-D has a very full set of modeling options, and all are easily customizable to whatever degree is desired. The toolbox features icons for the Four Primitive Groups (some members of which are very unusual):

1. Sphere, Cube, Cylinder, Cone, Plane.
2. Cup, Torus, Truncated Cylinder, partial Cylinder.
3. Extruded Triangle, Cylinder with Triangular Hole, Extruded and Twisted Pipe.

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4. Twisted Object, Round Cornered Cube, Pyramid, Coiled Section, Banana (that's right! Banana!).

That's only a small hint at what Infini-D's modeling features can provide. Double clicking on any object brings up one of the best modeling utilities around. From here, you can customize any object in Infini-D's library, or design your own from scratch. Tools include a full extrusion Modeler and a symmetrical lathing process. The object that can't be designed here just can't be sculpted, period.

Boolean Operations Although objects can be designed with holes in them in Infini-D's modeling module, and combined on screen into various shapes, Infini-D has no Boolean modeling mode as such.

Texture mapping Infini-D offers the user several modes for texture mapping an object, although drag and drop is not supported at the time of this writing. The Surface Floater window lists all of the available textures by name, and show a view of the picture map currently selected. Double Clicking on the picture stamp brings up the edit picture dialog, while selecting edit from the Surfaces Window brings up the full editing parameters dialog. All of the parameters are open for editing, including tiling, mapping, bump, and light associated (ambiance and so on) options. Consequently, any texture chosen becomes a gateway to infinite possibility. As far as applying textures to objects in the scene, full control over preview rendering quality and anti-aliasing is offered.

Lights Infini-D has a visual controller for distant, point, and spotlights that

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shows immediate lighting response in the camera view if higher quality rendering is on. Light intensity and shadowing are also facilitated, as is light color. A Light Info dialog is also accessible, giving you numerical control over a light's intensity and placement angles.

Rendering The best thing about Infini-D rendering is that you can manipulate the previews so that there are no surprises. being able to target a high quality rendering with full anti-aliasing on in preview mode let's you know exactly what you're going to get. Coupled with the WYSISWYG lighting features, exacting rendering is made easy. Environmental Maps, Fog, and Background image settings can also be shaped with ease. Shading (Shadows) and Ray Tracing (Shadows, Reflections, Transparency) can all be switched on in the Rendering Options window. Images and animations can be rendered to disk according to view, quality, color and resolution.

Included Libraries Texture and 3D Object libraries are included with the software.

Animation Full animation features with velocity, motion paths, frame rate and number settings, and a full featured keyframe Sequencer are included.

Other Special Features Infini-D is compliant with QuickDraw 3D for viewing real textures in preview modes.

File Load/Save Conventions In addition to loading and saving files in the Infini-D format, you can import Objects (Swivel 3D and DXF), EPS files, and Images (in any resolution and color depth). Objects can be exported as DXFs.

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Infinite FX

See

Xtras

Infinite Loop

In programming, an infinite loop is a repeating series of computer instructions that cannot exit. Many freezes are caused by the computer entering an infinite loop in which it cannot respond to user input such as mouse clicks or typing. In most cases, programmers avoid infinite loops at all cost for this very reason.

Interestingly, Infinite Loop is also the name Apple chose for a road on its main **Cupertino** campus. Apple's primary mailing address is "1 Infinite Loop." Although it might be tempting to attach some greater significance to this address, the name actually came from a contest among Apple employees.

See Also

Cupertino

InfoSeek

Internet search engine provided by the InfoSeek Corp. of Santa Clara, California.

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InfoSeek comes in two varieties: a free service and a subscription service. What you see on Netscape's "Internet Search" page lets you search InfoSeek's database of **World Wide Web** pages as many times as you wish without charge. You type a word or words in the text-entry field and choose Run Query or press Return or Enter. InfoSeek then returns the first 200 Web documents related to your query. It recognizes English phrases as well as keywords, and indexes entire documents rather than just titles, headings, or keywords.

InfoSeek maintains a number of databases other than its 200,000-page/2 million article Web database, but you have to subscribe and pay fees to get access to them.

Home page for InfoSeek is <http://www2.infoseek.com/>.

See Also

World Wide Web Page

INIT 17 Virus

This virus infects the System file and application files. The message:

From the depths of Cyberspace

is displayed only the first time an infected Macintosh is started after October 31, 1993. INIT 17 can cause system crashes.

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See Also

ANTI Virus; CDEF Virus; CODE 1 Virus; CODE 352 Virus; Frankie Virus; INIT 17 Virus; INIT 1984 Virus; INIT 29 Virus; INIT 9403 Virus; INIT-M Virus; MacMag Virus; MBDF Virus; MDEF Virus; nVIR Virus; Scores Virus; T4 Virus; WDEF Virus; ZUC Virus

INIT 1984 Virus

This virus only infects System Extensions and is designed to trigger an infected system that is started on any Friday the 13th in 1991 or later. The virus changes many folder and filenames to random characters. File creators and file types are also changed. INIT 1984 can delete some files. There are at least two Friday the 13ths each year.

See Also

ANTI Virus; CDEF Virus; CODE 1 Virus; CODE 352 Virus; Frankie Virus; INIT 17 Virus; INIT 1984 Virus; INIT 29 Virus; INIT 9403 Virus; INIT-M Virus; MacMag Virus; MBDF Virus; MDEF Virus; nVIR Virus; Scores Virus; T4 Virus; WDEF Virus; ZUC Virus

INIT 29 Virus

This rapidly spreading virus infects system, application, and document files. Infected applications do not need to be run in order for INIT 29 to spread.

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System crashes and printing problems are common symptoms of this virus.

See Also

ANTI Virus; CDEF Virus; CODE 1 Virus; CODE 352 Virus; Frankie Virus; INIT 17 Virus; INIT 1984 Virus; INIT 29 Virus; INIT 9403 Virus; INIT-M Virus; MacMag Virus; MBDF Virus; MDEF Virus; nVIR Virus; Scores Virus; T4 Virus; WDEF Virus; ZUC Virus

INIT 9403

INIT 9403, also known as SysX, is very destructive. After infecting a certain number of files, INIT 9403 erases disks that are larger than 16MB mounted to your desktop.

See Also

ANTI Virus; CDEF Virus; CODE 1 Virus; CODE 352 Virus; Frankie Virus; INIT 17 Virus; INIT 1984 Virus; INIT 29 Virus; INIT 9403 Virus; INIT-M Virus; MacMag Virus; MBDF Virus; MDEF Virus; nVIR Virus; Scores Virus; T4 Virus; WDEF Virus; ZUC Virus

INIT-M Virus

This is a malicious virus that is triggered on any Friday the 13th. INIT-M damages a large number of folders and files by changing their names, file types, and creator codes. This virus only spreads under System 7.

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See Also

ANTI Virus; CDEF Virus; CODE 1 Virus; CODE 352 Virus; Frankie Virus; INIT 17 Virus; INIT 1984 Virus; INIT 29 Virus; INIT 9403 Virus; INIT-M Virus; MacMag Virus; MBDF Virus; MDEF Virus; nVIR Virus; Scores Virus; T4 Virus; WDEF Virus; ZUC Virus

INITs

Initialization programs (INITs) were used to **customize** pre-System 7 Macs by adding additional functionality and features. INITs are now called **extensions** in **System 7** and higher. To use an INIT, place it in your **System Folder** (in **System 6x**) and **restart**. INITs load into the system during **startup**. INITs are preprogrammed to add a particular feature to your system, such as the way **QuickTime** adds movie playback capability for example. INITs don't need input from the user, and you cannot adjust the preferences or settings of an INIT.

See Also

Customizing; Extensions; Extensions Manager; INIT Conflicts; QuickTime; Restart; Startup; System 6x; System 7; System Folder

INIT Conflicts

INITs (initialization programs) are instructions that load additional features

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or functionality to your **system** at **startup** . Apple now calls these additions to your system **extensions** , but they work the same way as INITs did. INIT conflicts occur as you add more INITs to your system. Sometimes a new INIT conflicts with the operation of INITs in the system and cause problems, such as freezing or crashing. This is an INIT conflict. INIT conflicts often occur during startup and **freeze** or **crash** your machine or display a system error before the computer completes its startup.

To resolve an INIT conflict, you have to find out which INIT is causing the conflict. If you've recently added an INIT, the solution may be **restarting** your computer while pressing the Shift key (which disables all INITs from loading into the system) and removing the culprit. But if you need the functionality that this new INIT provides, you need to remove your INITs and place them in a separate folder outside your **System folder** . Then put the INITs back into your system folder, one-by-one, and restart the computer after you've added each INIT. If you add an INIT and the machine suddenly freezes, you've found the conflicting INIT.

If your INIT conflict occurs during startup, renaming an INIT may resolve the conflict. INITs load alphabetically, so changing the name of an INIT will change the loading order.

Apple has included a free utility program installed with System 7.5. and higher, called **Extensions Manager** (created by an Apple employee Ricardo Batista) that speeds up the process of elimination without having to move items in and out of your System Folder. Another popular manager of

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extensions is Startup Manager, which is part of the Now Utilities from Now Software. Conflict Catcher, a third-party utility from Cassady and Greene, is also gaining popularity as a way to keep conflicts under control and manage the loading of your extensions.

See Also

Crash; Extensions; Extensions Manager; Folder; Freeze; INITs; Restart; Shift Key; System Startup

Initializing Printer Message

The first time you startup your printer, it's initialized. This is when the Macintosh tells the printer that it is connected to a Macintosh and prepares the printer for printing. This occurs when you first turn on your printer. After it is initialized, the printer doesn't need to be initialized again, unless it is turned off or power is interrupted. When you choose the **Print** command after turning on the printer, Apple's **PrintMonitor** displays a printing status bar. A message appears stating that the printer is being initialized.

However, if you are connected to a **network** in which Mac users and PC users share the same printer, every time you go to print your computer has to reinitialize the printer to let it know it's printing from a Mac. For that reason, you'll see the Initializing Printer **message box** before each print cycle.

See Also

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Network; Message Box; Printing; PrintMonitor

Initialization

See

Disks, Initializing

Ink Trapping

Ink trapping is the term used to describe the process of printing one ink on top of another, a situation that arises in process-color printing. Ink trapping should not be confused with the **color trapping** of misregistered images. There are two types of ink trapping on a printing press: wet trapping and dry trapping. In wet trapping, wet ink is printed over wet ink. In dry trapping, wet ink is printed over dry ink. A buildup of ink in solid areas may be detrimental, so methods have been devised to prevent excessive ink trapping. The two most common are **Gray Component Replacement (GCR)** and **Undercolor Removal (UCR)**.

See Also

Color Trapping; GCR (Gray Component Replacement); UCR (Undercolor Removal)

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Inkjet Printing

See

Printing Technology, Inkjet

Inserting a Disk

To insert a **disk** into your computer's **disk drive**, hold the disk with the label facing up. Turn the disk so that the arrow next to the metal shutter is pointing away from you. This arrow indicates the direction to insert the disk into the drive. Slide the disk into the disk drive opening. Make sure the arrow on the disk is face up and pointing in the direction that you're inserting the disk. The **icon** for the disk will appear on the **desktop** a few moments after the disk has been properly inserted.

If for some reason you should insert the disk incorrectly, or the disk becomes stuck in the disk drive, you can have the disk drive manually eject the disk. To do this, you must first straighten out a paper clip and insert the straight end into the small hole below the disk drive on your Mac. As you insert the paper clip into the hole, you hit a spot of resistance. At that point you should press firmly, causing the drive to do a manual eject and hopefully pop the disk out. If you're not able to eject the disk using this paper clip method, the case may have to be opened and the disk drive taken apart to reach the trapped disk. If this is the case, refer the situation to qualified service technicians.

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See Also

Desktop; Disk; Disk Drive; Icon

Insertion Point

The insertion point is the blinking point where the next typed item is inserted into your document. If, for example, you're using a word processor, a blinking vertical line shows you where the text that you type will appear. You can move the insertion point by clicking the **I-beam** text cursor in a different location. The insertion point is now where you clicked. When you select a block of text, the insertion point disappears. It reappears at the next point you click your cursor. So if you're cutting text from one area to move to another, you can click your insertion point at the point where you want the cut text (temporarily stored in the Clipboard) to be inserted.

You can control the speed at which the insertion point blinks on the **General Controls Control Panel** . There are three speed settings: Slow, Medium, and Fast.

See Also

Click; General Controls Control Panel; I-Beam Cursor; Mouse

Inside Macintosh

Inside Macintosh is Apple's official documentation of the MacOS

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Application Programming Interface (API) Toolbox.

Inside Macintosh started as a three volume set that covered everything there was to know about the original Mac Toolbox. As new features were added to the System, three additional volumes were published, including the genuinely massive Volume VI, which covered the additions made in System 7. The trouble with these books was that many topics were spread over more than one book, and information in some of the early volumes was superseded by newer information in the later ones.

In 1992, Apple decided a change was in order. The entire mass of Macintosh API documentation was reorganized by topic into the *New Inside Macintosh* volumes (sometimes abbreviated as NIM). More than 24 volumes have been released, of which six full volumes are dedicated to **QuickDraw GX** .

If you're interested in getting started in Mac programming, you don't need to rush to the store and buy a copy of each *Inside Macintosh* book. In fact, you might not need to buy any! Apple has released two electronic versions of *Inside Macintosh*: the *Inside Macintosh* CD-ROM and the **Macintosh Programmers Toolbox Assistant** (also on CD-ROM). The first contains most of the volumes in a format that reproduces the appearance of the printed books. The second is a searchable hypertext database of all of the toolbox routines documented in *Inside Macintosh*. Many of the *Inside Macintosh* volumes are also available in Adobe Acrobat format on Apple's Developer Web site (<http://dev.info.apple.com/>).

If you do prefer the printed versions of the books, start with the volumes that

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cover the basics: *Inside Macintosh: Macintosh Toolbox Essentials*, *Inside Macintosh: Imaging With QuickDraw*, *Inside Macintosh: Files*, and *Inside Macintosh: Memory*. There is also an overview volume available.

See Also

Application Programming Interface; Toolbox; QuickDraw GX; Macintosh Programmers Toolbox Assistant

Inside the Macintosh

See

Circuits, Parts of the Macintosh

Installer Disk

If you want to reinstall or update your **operating system**, you need to use Apple's Installer utility program. Although it takes a number of **disks** for a complete installation, only one disk, the installer disk, called Install or Install Me First, is needed to install a new **system**. If you are installing a new system from a **CD-ROM** version of the system software, the Installer is on the CD-ROM, but in some cases you may still need the Install Me First disk to startup the system if your CD-ROM is not bootable (meaning the CD-ROM has an installer on it and all other necessary files, but it does not have a system folder on the disc that you can startup your Mac from.)

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See Also

CD-ROM Disk; Operating System; System

Installer Utility

When you buy a Macintosh computer, the **operating system** is pre-installed on the computer, but if you ever need to re-install, or update, your **System** software, you'll use Apple's installer. The installer is a utility program that checks out which model and type of Macintosh you're using and installs into the **System folder** only the files your particular Mac needs. You can also designate that a new System folder be created when you run the installer.

These installers are particularly useful when the installation requires that some files be added to the **System Folder**, and other files added to other specific folders. The installer is also helpful if the installation will require more than just one disk. It's not unusual for an installation to take 10 or more disks to install just one application, and the installer helps to provide an easy-to-use interface, which tells you which disk to insert when, and it even ejects each disk when it has completed that disk's portion of the install.

Many third-party software developers use the Apple installer with their own products, under license from Apple. So, don't be surprised if you buy a software program and the installer looks very familiar.

The installer enables you to choose between an easy install, which installs

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the full compliment of **fonts** , **control panels** , and virtually every Apple system feature and **extension** available, and a custom install, where you select individual items from a scrolling list of options and features you may want to install.

One of the most popular installers was designed by Apple, called the Apple Installer, and is often licensed to third-party developers. This installer works nicely because it first checks out which model and type of Macintosh you're using, and then installs only the files your particular Mac needs. The installer also offers you the choice of a one-button Easy Install, which loads the full recommended version of the application, along with any sample, tutorials, fonts, and so on that the developer has designated. If you don't want a full Easy install, you can usually choose Custom Install from the installer's **pop-up menu**.

This custom install option enables you to decide which individual files you want the installer to install. For example, when you choose Custom Install, you'll see a list of all the files an Easy install would have installed, and you can select by **checkbox** which files to install. If you see a file that you already have, such as **SimpleText** , you can choose not to check that file for installation.

If you're installing Macintosh System 7.5 or higher, there is a separate install required if want to use QuickDraw GX and PowerTalk.

See Also

Control Panels; Extensions; Fonts; Operating System; System; System Folder

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Installing Fonts

In System 7 and higher, to install a **font**, make sure no applications are running. **Select** the font you want to install and **drag** that font into the **System Folder**. The System displays a alert box stating, "Fonts need to be stored in the **Font Folder** in order to be available to the Macintosh. Put the font (font name will appear here) into the Fonts folder?" If you **click** OK, the system puts the selected font into the font folder for you. The font is now installed. To remove a font, make sure no applications are running, and drag the selected font out of the fonts folder.

If you are using System 6 through System 6.7, you install fonts by using the Font/DA Mover utility to install your screen fonts directly into your System file.

See Also

Alert Box; Click; Drag; Font Folder; Font/DA Mover; Fonts; Icon; Selection; System Folder

Installing RAM In PowerBooks

See

PowerBook RAM

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Installing Software

Most software uses an **installer** program to install the application onto your hard drive. It used to be possible to **drag** an application off a **disk** and onto the **hard drive** to complete the installation. But with applications getting larger and larger and requiring that items be saved in the **System folder**, installation now involves multiple disks and an installer program. One of the most popular installers is Apple's, which is licensed for use to software developers. The Apple **Installer** offers an Easy Install option that installs all necessary files, as well as tutorials, samples, add-ons, and so on, or you can choose a custom install that enables you to choose which items you want to install from a scrolling list.

If you're installing your system from a set of disks, after you choose an installation option, the installer determines which elements from which disks are needed to complete installation. When the installer is finished with one disk's portion of the install, it **ejects** the disk and prompts you for the disk it needs to continue.

See Also

Click and Drag; Disk; Eject; Hard Drive; Installer; System Folder

Inspiration

See

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Idea Generators

Integrated Data Viewer

A component of Apple Computer's **Cyberdog** suite of **Internet client** applications implementing OpenDoc technology.

Along with Cyberdog's standard **World Wide Web browser** window, the Integrated Data Viewer presents images, movies, or sounds.

Whereas other browsers such as **Netscape** or **Mosaic** might display an **inline image** as being in-line with the text or other **Web page** content, Cyberdog's Integrated Data Viewer presents information about the size and location of the image, as well as a set of "handles" that can be used by the user to resize the image within the Cyberdog browser window.

See Also

Client; Cyberdog; Internet; Web Browser; World Wide Web

Integrated Development Environment

The Integrated Development Environment (IDE) is a set of development tools designed to work together smoothly to manage all aspects of the programming process. IDEs typically include an **editor**, one or more **compiler**s, and one or more **linker**s in a single application. They might

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also include a debugger in the same application, but it's just as likely that the debugger is a separate program closely linked to the IDE using **AppleEvent s**.

Unlike traditional development environments, where the burden of juggling various tools and keeping track of which source code files need to be recompiled is squarely on the programmer's shoulders, IDEs take much of that work away from the programmer.

IDEs usually organize all of the source code files and libraries into a project (see following figure). The project keeps track of which files have been changed and need to be recompiled. Relationships among source and library files are contained entirely in the project, and the makefiles required by other development environments typically are not needed.

In combination with the close integration of the editor, compiler, and linker, this gives IDEs a significant speed edge in development. It's not unusual to be able to make a change in a source code file, recompile, link, and run a program using an IDE in less time than it would take to just compile in a non-integrated environment.

Frequently, however, IDE tools are weak in their handling of very large projects. A project, for example, that includes 68K, Power Mac, and Fat versions of an application, along with an Extension or Control Panel and a custom menu definition function used in the application would be very difficult to build all at once in an IDE. Under MPW, on the other hand, it wouldn't be difficult to create a single script that takes care of the whole

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thing. As IDEs have become more and more scriptable, this shortcoming is gradually disappearing.

Most major development environments on the Macintosh are IDEs, with the significant exception being MPW. Part of the reason for this is that most non-integrated tools are designed to work in the MPW environment. In fact, many of the most popular IDE-based compilers (Symantec C++, CodeWarrior) are available in MPW versions for those programmers who would rather not use an IDE.

See Also

AppleEvents; CodeWarrior; Compiler; Editor; Linker; MPW; Symantec C++

Integrated Services Digital Network

See

ISDN

Intel Capabilities, Adding

There are two options for running Microsoft DOS and Windows 3.1 or 95 on your Mac: loading software that emulates the Intel world or installing a physical DOS compatibility card that adds an Intel 486 chip set to your Mac.

Insignia Solutions markets SoftWindows 2.0, a PC software emulator for Macs.

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This is an upgrade to an original emulator that created a 286-based PC on the Mac but did not run 386-enhanced mode applications. The new software upgrade version 2.0 emulates the 486 instruction set at speeds approaching a 66MHz 486 on a 60MHz **Power Mac** with 16MB of RAM. A Windows 95 version of SoftWindows is also available, which

- Emulates an Intel 486 processor
- Provides Windows sound (WAV format) integrated with Mac sound and microphone for Windows multimedia
- Provides simultaneous Mac and CP access to IPX and TCP/IP networks for both Ethernet and Token Ring networking with Novell Netware
- Can be controlled using AppleScript (the Mac's macro language)
- Supports Super VGA video resolution

Apple and third-party vendors offer DOS compatibility cards for Power Macs and 68040 Macs, as well as 68040-based Macs with pre-installed PC cards that provide 50- and 66MHz 486DX2 and 100MHz DX4 chip sets. The Performa 640CD DOS Compatible and the LC 630 DOS Compatible provide built-in support for PC operating systems.

In addition, Orange Micro and Reply provide high-speed 486-based PC cards that include a Pentium OverDrive socket that lets you add a Pentium CPU (although the bus remains hobbled by the speed of the 486 processor). Orange Micro plans on offering a PCI expansion card based on the Pentium

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chip, as does Apple and Reply.

The following table provides an overview of the options available for adding Intel capabilities to your Mac.

Running Windows on a Mac: The Available Options

Mac Model

PC Card Option *Features*

Centris/Quadra 610, 650, Quadra 700, 800, 900, 950 and Power Mac 7100/66

Reply's DOS on Mac and DOS on Power Mac PDS cards DOS on Mac comes in two speeds: 50MHz 486DX2 and 66MHz 486DX2; DOS on Power Mac Card comes in two speeds: 66MHz 486DX2 and 100MHz 486 DX4 DOS-Compatible cards in the **PDS slot** .

LC III, Performa 470 series, 550 series, 570 series, and Quadra 630 series

Apple Mac LC 630 DOS Compatible or Performa 640CD DOS Compatible computers or SoftWindows 2.0
Totally new computers or software emulation .

Power Mac 7200, 7500 , 8500, 9500

Orange Micro 400 Card or SoftWindows 2.0 PCI expansion card

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See Also

Consumer Macs; Macintosh Family; PCI Slot; PDS Slot; Performas; Power Macs

Macintosh Microprocessor Technologies

<i>Processor Model</i>	<i>Date Introduced</i>	<i>Clock Speed</i>	<i>Internal Cache</i>	<i>Bus Width</i>	<i>Mac Models</i>
68000	1984	8 to 16.67 MHz	none	16-bit bus and 32-bit internal bus	Classic, PowerBook 100, SE, Plus, 128K, 512KE
68020	1984	up to 33 MHz	256-byte instruction cache, optional 68851 PPMU	32-bit LC and LC II	generation Mac II
68030	1987	up to 33 MHz	built-in PPMU, 256-byte instruction and data caches	32-bit	Mac SE/30, Classic II, Color Classic, IIsi, Ilic, IICx, IIX, LCIII, IIvx, LC520, Macintosh TV
68040	1989	25 to 33 MHz	built-in PPMU, 4K data and instruction caches, subset of 6882 math coprocessor	6-stage pipeline, 32-bit bus width	LC/Performa 475, Performa 630 series, Centris/Quadra, 610, 650, Quadra 605, 660AV, 840AV, 700, 800, and 950, PowerBook 14x series, 16x series, 170, 180/180c, 5xx series, 190, Duo 2xx series. Workgroup Servers 60, 80, and 95

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PPC 601	1994	60 to 100 MHz	32K data and instruction caches, built-in single-precision FPU	3 independently pipelined instruction units for 8-stage pipelining, 64-bit	6100, 7100, 8100, 7200. Workgroup Server 6150, 8150, and 9150
PPC 603 and 603e	1995	66 to 100 MHz	32K data and instruction caches, built-in single-precision FPU, power management features for lower power consumption	3 independently pipelined instruction units for 8-stage pipelining, 64-bit	Performa 5215, 62xx series, and 6300, PowerBook 5300, LC 5200
PPC 604	1996	100 to 150 MHz	double-precision FPU, 256K data and instruction caches	dynamic branch prediction and speculative execution, 64-bit	7500, 8500, 9500

Intellectual Property

The typeI52g of property protected by **copyright** law—original work such as plays, cartoons, television shows, personal letters, software, and so on.

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Intellectual properties are the children of the brain. **World Wide Web** pages, too, are intellectual property, and thus protected by copyright.

See Also

Copyright; Fair Use; World Wide Web

Intellidraw

See

Other Drawing Applications

IntelliHance

IntelliHance works on CMYK, RGB and Grayscale graphics. This Extensis plug-in operates either automatically or in accordance with adjusted manual input to change the selected graphic's tone, saturation, sharpness and despeckling. Despeckling is a term used to indicate the removal of stand-alone pixels in the graphic, commonly introduced into scanned images (dust marks, etc.). In automatic mode, IntelliHance adjusts the graphic according to its own intelligent assumptions based on a comprehensive investigation of the graphic. This investigation takes milliseconds, and usually goes unnoticed by the user. Passing the cursor over any selected pixel in the graphic produces a readout that describes what was changed and by how much. A comparative side-by-side view of the original graphic and a preview

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of the transformed graphic allows you to appreciate the changes visually, although most of the changes may be visually unnoticeable. A Preferences setting allows you to fine tune the image transformations according to Brightness (from Balanced Tones to Shadow alterations), Saturation, Sharpness (which usually adds some speckling), and Despeckle (which adds blurring).

The manual option (called “fine tuning”) allows more interactive transforming to with the selected graphic. Here, you can adjust the following parameters with interactive sliders: Tone (Black Point, Mid Point, White Point), Saturation (from -100 to +100), Sharpness (Amount, Radius and Threshold), and Despeckle (Amount, Lower and Upper Limits from 0 to 255). The result is an image whose every parameter is controlled by the user for printed output and visualization. The magic of Intellihance is that no matter the condition of the image addressed by it, it can intelligently and automatically apply the right stuff to bring it back from the dead.

Interactive Fiction

See

Hypertext Fiction, Return to Zork, Adventure Games, Non-Linear Storytelling Games

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Interactive Multimedia Association

See
IMA

Interactive Presentation Programs

Interactive Presentation programs make it possible to create simple interactive presentations without **scripting**. This is usually accomplished with a library of simple actions (play a sound, mouse clicks, jump to a specified screen) that can be attached to on-screen objects. These objects act as buttons.

It's possible to create reasonably complex projects using programs such as Gold Disk Inc.'s Astound and Special Delivery. You can create kiosks, encyclopedias, and electronic brochures with these tools.

See Also

Action!; Astound; Special Delivery

Interface Builder

Before the graphical user interface (GUI) of the Macintosh burst onto the scene, creating the interface of most applications was relatively simple. Because most interfaces were not graphical, they could easily be designed

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and laid out directly in the program's code. The Mac changed all that. With its easy-to-use interface came some programming challenges, including how to create an effective *visual* interface with non-visual tools.

This problem led to the development of today's crop of interface builders. Although interface builders exist for non-graphical computers as well, they are not as complex as those for graphical systems. Interface builders enable the programmer to "draw" the interface elements as they appear in the finished application.

The simplest interface builders are **resource** editors, such as **ResEdit** and **Resorcerer** . These enable you to visually edit simple interface elements, such as dialogs and menus. Much of the real programming work, however, is left up to you. Although Resorcerer can generate source code to handle dialog boxes, in more complicated situations, you're out of luck. The advantage of these editors as interface builders is that they work with virtually every development environment relying on standard Macintosh resources.

A significant step up from resource editors are view editors. These enable you to edit the visual view hierarchy used by a related application framework or class library. Metrowerks' **Constructor** , for example, enables you to visually edit the view resources used by Metrowerks' C++ framework, **PowerPlant** . Similarly, **AdLib** can be used to edit the visual hierarchy used by **MacApp** (see following figure). These interface builders do not generate code based on your interface, but they do build directly on the interface code

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provided by the underlying framework. In fact, in some simple cases, no additional programming is necessary.

Another step up the interface builder food chain are programs that generate much of the code needed to implement an interface. Symantec's Visual Architect and Bowers Development's AppMaker are in this category. **Visual Architect** generates code exclusively for the Think Class Library (TCL), whereas **AppMaker** generates code for PowerPlant, MacApp, TCL, or procedural programming.

Other kinds of interface builders exist for specialized programming projects. **FaceSpan**, for example, can create relatively sophisticated visual interfaces for **AppleScripts**. Many database access tools also provide visual interface builders for creating client interfaces to data stored in a database server.

See Also

AdLib; AppMaker; Constructor; FaceSpan; MacApp; PowerPlant; Resorcerer; Visual Architect

Interface Guidelines

See

Human Interface Guidelines

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Interleaving

See

Disks, Interleaving of

Internal Cache

See

Power Macs, Logic Boards

Internal Clock of the Macintosh

Because the Macintosh is such a symbiotic beast, it needs a coordinator to mediate between its hardware and software requirements. The coordinator or conductor for the Mac is its **internal clock** —a quartz crystal that vibrates millions of times per second when stimulated by electric current. (The vibrations are measured in megahertz (MHz), which is why we speak of “clock speeds” for microprocessors.) The internal clock’s speed and its connecting circuitry controls the RAM by periodically refreshing the contents of its registers, the video display circuits refresh rate is also governed by the clock speed, and the CPU uses the internal clock to time its access to RAM, ROM, and peripherals. The faster the clock rate, the better the performance of the computer.

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Motorola produces microprocessors that resonate at different clock rates. An individual microprocessor, such as the PPC 601, can be produced and validated at several different clock rates. This is why some Power Macs with the same chips are faster than others, and why periodically Apple can give a speed boost to a Mac without renaming a model simply the exchanging a slower chip for one with a faster quartz crystal.

In November 1996, Apple is increasing the speeds of the 604 PowerPC chip to 200MHz, giving the PowerMac 7500, 8500, and 9500 a boost by replacing the 604 chip with the 604e chip.*

TIP Apple's plans for upgrading the second-generation Power Macs were taken from two articles in *MacWeek* by Joanna Pearlstein, 3/18/96 "Apple Plots 1996 CPU Paths" and 3/11/96 "Speed Bump Ahead for Power Macs."

See Also

680x0 Chips; Microprocessors; Processors; PowerPC Chips

International Electrical Commission

See
IEC

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International Keyboards (Keyboard Shortcut)

If you have a variety of international keyboard layouts in your **Keyboard Control Panel**, you can rotate them by using **Option-⌘-Spacebar** . For this keyboard shortcut to be activated, you **click** the **checkbox** entitled, "Use Option-⌘-Spacebar to rotate through keyboard layouts," on the Keyboard Control Panel.

To switch between international keyboards, use this keyboard shortcut:

1. Activate the keyboard layout toggle feature by clicking the checkbox in the keyboard control panel and then close the control panel.
2. Hold the Option-⌘-Spacebar to toggle through layouts from the keyboard.

See Also

Check Box; Click; Close; Command; Control Panel; Keyboard; Keyboard Shortcuts; Option; Spacebar

International Standards Organization

See

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ISO

International Telecommunications Union—Telecommunications Standards Sector

See
Modems

Internet Adapter, The

See
TIA

Internet Address

See
IP Address

Internet, Areas

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See

Internet Services

Internet, Educational Resources on

The **Internet** has something for everyone, and a lot of what's there is geared toward students and teachers. That's not surprising, because it originated on college campuses as a way to tie research projects to the National Science Foundation and to the other government agencies that funded them. The material on the Internet isn't only for college-level students and faculty, though. There are areas devoted to kindergarten, pre-K, Montessori, and grades 1-12. A **Webcrawler** search on "Montessori" found 88 different sites. A search on "elementary school" found 38, 282 pages! And many of these have "pointers" or **links** to other interesting places.

There are many wonderful pages for kids and parents or teachers to explore on the **World Wide Web**. Start with a single site such as the Hands-On Children's Museum (<http://www.wln.com/~deltapac/hocm.html>) and branch out to other recommended places.

Their Ocean Odyssey section alone has 33 pointers to other ocean-related sites. But don't leave kids to play unsupervised. Despite the attempts to regulate what goes onto it, some of the content may be educational in ways a parent or teacher might not appreciate. Turning younger kids loose to surf the 'Net unattended is about as sensible as turning them loose in Times

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Square at midnight.

The Web can take you and your kids to places you could never go otherwise, even to places that don't exist. Boston's Museum of Science has recently placed on view on the Web a Virtual Museum with exhibits that go far beyond what's possible in a real museum. There's a dinosaur "exhibit" called Dinosauria at the University of Berkeley

<http://ucmp1.berkeley.edu/diapsids/dinosaur.html>

that uses illustration and hypertext to take you on an detailed field trip through time, back 65 million years.

The Internet can even save you a trip to the library. Project Gutenberg, (named for the inventor of moveable type) is bringing some ten thousand volumes to the computer screen. Volunteers at the Illinois Benedictine College have entered several thousand books to date (all beyond copyright or cleared, of course) as text. Such works as *Moby Dick*, *Alice in Wonderland*, and the *Scarlet Letter* can be downloaded from the Project Gutenberg FTP site, along with a catalog of all the available works. The address is:

http://www.jg.cso.uiuc.edu/pg/pg_home.html

Academy One is an on-line educational resource for students, educators and parents at <http://www.nptn.org/cyber.serv/AOneP>. This site presents a collection of curricula, contests, forums, and references, for K-12. It's maintained by the National Public Telecomputing Network. CollegeNET, another World Wide Web site

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<http://www.unival.con/cn/collegenet.html>

includes connections to hundreds of colleges and universities, scholarship searches, discussion groups on a variety of subjects, a connection to the Princeton Review SAT prep courses, and important information on SAT, GRE, GMAT and other entrance exams.

There are many more resources than can be listed here, and new ones being added virtually every day. The best way to discover Web sites that will be relevant to your needs is to use a Web search utility such as **Lycos** (<http://www.lycos.com/>) or **Webcrawler** (<http://webcrawler.com/>).

See Also

Internet; Lycos; Webcrawler

Internet Explorer

A full-featured **browser** or **client** program for navigating the **World Wide Web** offered by Apple's archrival Microsoft.

Internet Explorer, originally released for the Windows 95 platform to act as gateway to the Microsoft Network on the Internet, was released for the Macintosh in beta version in early 1996.

Internet Explorer claims to require less memory than other browsers. It does have some unique features[em]mainly, Microsoft's extensions to HTML, which create some exciting effects that, however, can be viewed only with

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Internet Explorer:

- A <MARQUEE> tag that makes text scroll across the Web browser screen, like a theater marquee.
- The capability to create “startup sounds” that play when a reader accesses a **Web page**.
- Support for inline video.

Internet Explorer allows users to read **Usenet** news from within the browser, many **HTML 3.0** commands and **Netscape** extensions.

Home page: <http://198.105.232.4:80/windows/ie/mac/macdl.htm>

See Also

Client, NCSA Mosaic, Netscape Navigator, PPP, SLIP, URL, Web Browser, World Wide Web

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INTERNET

A worldwide system of interconnected computer **networks** that enables data communication using services such as electronic mail (**email**), file transfer (**FTP**), the **World Wide Web** , and discussion groups (**newsgroups**).

The Internet (or, more commonly, the Net) is a way of connecting existing computer networks that greatly extends the reach of each participating computer and network. This network of networks consists of an immense number of participants, connected machines, software programs, and a massive quantity of information available almost instantly to any computer user worldwide.

Internet, Getting Connected Users wishing to connect their Mac to the Internet and access its services can use any of several different methods.

Partial Internet access can be achieved through **commercial online services** (such as **America Online** , **CompuServe**, and Apple's **eWorld**), local **bulletin board systems** (**BBSs**), **UNIX shell accounts** , and **UUCP** access.

Conversation with Adam Engst

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Adam Engst helped launch the rest of us onto the Internet and the World Wide Web, through his books (the latest being the *Internet Starter Kit for the Macintosh*, 3rd Edition, from Hayden Books) and updates (called TidBITS). You can get his latest advice by emailing info@tidbits.com, or get answers to some common questions via email at faq-adam@tidbits.com or via the Web at <http://www.tidbits.com/adam/FAQ.html>.

Maclopedia: Can you recall for us your first experience with a Mac?

Adam: In 1987 at Cornell University, I decided I wanted a job as a part time operator in the public computer rooms. At the time, I had an Atari 1040ST and had barely ever used a Mac before. I was fairly fluent with DOS as well, and figured I could talk my way into the job. I could and I did, and figuring out how to help students on the Macs that made up half of the machines in the room I worked in was interesting, especially since many of them were taking programming courses. Amazing how much Pascal you can learn just from trying to help others. When in doubt, they forgot a semicolon...

Maclopedia: Did you have something to do with helping your parents turn to Macs? You mention that they use them in the Internet Starter Kit.

Adam: Yes and no. My parents had a Franklin Ace 1000 that was an Apple II clone, and it was actually the second one they'd gotten. I'd taken the first one to Cornell with me and used it until I got the Atari. Then, when the time came for them to get a new computer, I had a Mac and tried to convince them to get one, but my mother's department

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(Manuscripts and Archives) only had a single IBM PC. She wanted to be able to work on stuff at home, so they ended up buying some PC clone. I never liked that machine. Then, by the time that machine was nearing the end of its lifespan, the Archives had switched over to Macs, so Mom and Dad got an LC II, which they still use. I had agitated heavily for the Mac during the time of the PC, since I had to keep it running and generally help them with it. Even now, my sister and I generally help keep their Mac running, but they can do a lot more with the Mac than they ever dreamed possible with the PC.

Maclopedia: What was your experience with Macs when you were at Cornell?

Adam: As I said, I was an operator in one of the public computer rooms for a semester, and after that semester, I moved up in the ranks. The first summer I told my boss that I wanted to work full time, so I ended up taking care of another computer room for the entire day. That room had no Macs when I started, but during that summer we added 16 Macintosh SEs with a LocalTalk network and a pair of file servers. I helped design the room, and after that summer, I became a supervisor in charge [of] that room and others. A friend and I once realized we could set the shared bit on a program using ResEdit, and then multiple users could run the same program. This was useful because the only reason there were two servers in this public room was because it was the way the network people had decided on to hold 16 copies of MacDraw and the other software we had licensed for public use. Since

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we owned legitimate copies, my friend and I thought we could turn off an entire server and serve everything from a single one with a single copy of each program. We could, we did, and boy did we get in trouble for showing up the network people (we'd failed to ask for permission before attempting our little experiment).

Maclopedia: Do you think the Mac offers any particular advantages for people who want to use the Internet? The World Wide Web?

Adam: Yes, the Mac is by far the best Internet client machine, and that includes the Web, which is, after all, just another part of the Internet. The reason is simple. The Mac has always had the best and most consistent interface, and the more complicated the topic, the more important the interface is.

The Internet is a big, confusing place, and having a good interface on it is important. Web browsers tend to be less obviously different, since they're cross-platform to begin with, but technologies like Cyberdog show what happens when you rethink how information can and should be put together.

Maclopedia: What kind of experiences have you had with Apple employees?

Adam: I've run into two types of Apple employees. There are the sort who are just doing a job in a big company, and dealing with them is just what you'd expect. However, I've met many more people in Apple who are extremely bright, interesting folks trying to do the best job they

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can and still change the world. They're the people I like to hang out with when I go to trade shows, and they're the people I correspond with in email the most. I have a lot of respect for these people within Apple, since they're often fighting to produce greatness within a corporate structure, and that's not easy.

Maclopedia: What's your sense of the Apple culture?

Adam: There's a love-hate relationship people have with Apple and their Macs. Most people love their Macs and can't figure out what's in the drinking water in Cupertino. Despite that split, Mac users are the most incredibly loyal computer users I've ever run into and probably the most loyal brand customers around. The best example of this is Guy Kawasaki's EvangeList, which is a mailing list devoted to singing the praises of the Macintosh and damning the competition. The fact that you can create a mailing list of 20,000+ people who are willing to read such unabashed propaganda and contribute to it, is utterly astonishing. You'd be hard pressed to come up with a product or company that can boast such customer loyalty.

Maclopedia: What should intermediate to expert Mac users be taking advantage of, as far as tools for the Net and Web?

Adam: I think intermediate to expert Mac users should be using the best tools for the job on the Internet. Web browsers can do most things on the Internet, such as FTP, email, and Usenet news, but they're generally pretty lousy at anything other than browsing the Web. Beginners

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might have an excuse, but anyone who's trying to get much out of the Internet should be using tools like Anarchie, Eudora, NewsHopper, and NewsWatcher. Utilities like CyberFinder, Internet Config, and ICeTee are essential once you get past the basics.

Maclopedia: Do you like the direction Apple seems to be headed in, combining some Net tools with Copland? If you were on the team, what advice would you give them?

Adam: I definitely think that building Internet tools into the operating system is a good move, but I'd caution them to remember the tenets of component software. If Apple's FTP part isn't as good as Peter Lewis's, then I want to be able to pull out Apple's easily and replace it. Apple should also seriously evangelize the best Internet developers and make sure that third-party tools can be integrated as deeply as possible. Users don't want to fuss with integration, and on the Mac they shouldn't have to.

I'd also try to get the team to think beyond the basics of what everyone does today and try to build in some technology that solves problems that really exist now. For instance, it's too hard to subscribe and unsubscribe from most mailing lists, and there's no standard way to turn one off while you go on vacation. Build in something that solves that problem—it's merely a matter of putting together the parts that exist today.

Full Internet access demands **MacTCP** and a direct (although possibly

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temporary) connection. Most often, these connections are accomplished via a phone line, a **modem**, and software to use the **PPP** or **SLIP** communication protocol with an Internet service provider, through whose host computer your Mac obtains Internet access. Constant, speedy connections are also possible via an **ISDN** line or a **T1** or **T3** dedicated line.

Internet, Hardware Two types of computers comprise the Internet: **hosts** and **clients**. Host computers (also called **servers**) are the machines that contain all the information and files that are consistently available online.

Client computers are the desktop computers or other machines used by people to request the information and/or files from host computers. The most common way for a client to connect to the Internet is via a modem and a phone line (see the following figure). Users can have their Macs dial into an Internet service provider, who runs a host machine directly connected to the Net, and thus be temporarily connected.

Internet, History The Internet began in 1969 as ARPANet, developed for the Advanced Research Projects Agency of the U.S. Department of Defense (ARPA).

ARPANet connected university, military, and defense contractors; its original intent was to assist researchers in sharing information. Much of that information centered on how to develop a decentralized communications network that could still operate if part of it was destroyed by nuclear attack.

Eventually, much of ARPANet's functions were taken over by the National

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Science Foundation Network (NSFNET), which linked researchers with five high-speed supercomputer centers. A standard protocol of choice was developed, **TCP/IP**, or Transmission Control Protocol/Internet Protocol. Because it was now possible for all sorts of computers to talk to each other, the Internet grew by leaps and bounds. In 1991 a new network was created that subsumed NSFNET: the National Research and Education Network, NREN.

These days, governmental dictates are giving way to commercial enterprise, and many companies take over maintenance of the network lines, and as businesses outpace governmental organizations in getting connected.

Internet, Size Numbers are difficult to track, because connections are often temporary and many users might connect via each machine. A CommerceNet/Nielsen survey released in October 1995 (<http://www.nielsenmedia.com/>) indicated that more than 24 million people in the U.S. and Canada use the Internet. However, another survey, by Find/SVP, reported only 9.5 million Internet users.

As of July 1995, there were 6,642,000 computers (or hosts) connected to the Internet, according to data collected by Network Wizards (<http://www.new.com/>).

Internet, Software Once users have a hardware connection to the Internet, software programs are needed to use **Internet services** such as email, newsgroups, and the **World Wide Web**. These applications (also called clients) enable the Mac to request and receive information from a remote server. **MacTCP** enables a Mac to speak the **TCP/IP** language and

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thus understand and be understood by other computers. Other software, such as **MacPPP** , is necessary for connecting via a modem

See Also

America Online, Bulletin Board Systems, Client, CompuServe, Email, eWorld, FTP, Host, ISDN, Internet Services, MacTCP, Mailing Lists, Modem, MUDs, Network, Newsgroups, PPP, Server, SLIP, T1, T3, TCP/IP, Telnet, UNIX, UUCP, World Wide Web

For More...

If you want to do this...

Go to this entry...

Learn about Internet services

Internet, Services

Get on the Web

World Wide Web

Know what HTML is

HTML

Browse the newsgroups

Newsgroup, Internet

Create a Web page

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Web Page, How to Design

Web Page, How to Write

Know what a server is

Web Server, How to Set Up

Web Site, How to Create

Know where to find Mac software

Shareware, Mac on Internet

Software Archives, Mac

Bibliography

For more information on the Internet, refer to the following references:

Internet Starter Kit for the Mac, 3rd Edition, Adam Engst, Hayden Books:
<http://www.mcp.com/hayden/iskm/>.

Publishing on the World Wide Web, Greg Holden, Hayden Books.

Global Network Navigator's Internet section:
<http://gnn.com/wic/wics/internet.new.html>.

Internet Gaming

See

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Online Live Games, Shareware, MUDs and MOOs

Internet Multicasting Service

A news and information service consisting of audio files distributed on the **Internet** , both as audio-on-demand archives and live **IP** multicasts.

IMS, which is supported by a number of corporations including IBM, MCI, Sun Microsystems, and O'Reilly and Associates, provides audio programs about Internet-related topics. IMS also multicasts programming from Monitor Radio, World Radio Network, CBC News, and U.S. Congress when in session.

Internet Talk Radio files are accessible in sites around the world via **anonymous FTP** . All files are in .au format. A half-hour program is a 15MB file.

Home page: <http://town.hall.org/radio/>.

See Also

AIFF Files; Anonymous FTP; .AU Files; Internet; MBONE; RealAudio; World Wide Web

Internet Protocol (IP)

Internet protocol is a protocol or set of standards designed to provide a universal method for locating and addressing **host** and **client** computers

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connected to the **Internet** .

IP was developed in 1981 for the Department of Defense Advanced Research Projects Agency (ARPA), which operated the Internet at that time. IP provides a way for interconnected computer networks to transfer “packets” of information from one computer to another. Each computer has a standard **IP address** , a series of four numbers separated by dots.

For more information see the Internet Working Group Request for Comments (RFC) 791 (<ftp://ds.internic.net/rfc/rfc791.txt>).

See Also

Client; Host; Internet; IP Address; TCP/IP; URL

Internet Relay Chat

See

IRC

Internet, Searching/Navigating

A number of utilities can be used to search for specific data and navigate through the rich resources of information contained on the **Internet** .

Each of the **Internet services** organizes information differently; therefore, each has its own way of searching for information. The various

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search engine s are described in detail elsewhere in *Maclopedia* (see entries in boldface). This following table summarizes the various search tools.

FTP (File Transfer Protocol)

Users generally employ a *client program* (such as a **Fetch** or **Anarchie**) to gain access to an FTP server that holds a great deal of information they can download, such as **software archives** or **mailing lists**.

Anonymous FTP

Users can log in anonymously using a program like **Fetch** .

Archie

A directory of anonymous FTP sites around the world, accessible via **Telnet**, or **email**, **Gopher** or **World Wide Web clients**.

Gopher

Users can run the client program **TurboGopher** to navigate Gopherspace, and conduct searches using **Veronica** or **Jughead** .

Telnet

NCSA Telnet is the most common Telnet application for the Macintosh.

Usenet

NewsWatcher is a popular client, as is

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Netscape Navigator; DejaNews and **InfoSeek** provide searches through newsgroup articles.

World Wide Web

Client software includes **Netscape Navigator, Mosaic, MacWeb, HotJava;** search engines include **InfoSeek, Lycos, and WebCrawler** .

WAIS

MacWAIS is a common client for WAIS servers.

See Also

Anarchie; Archie; Anonymous FTP; Fetch; FTP; HotJava; InfoSeek; Internet; Internet services; Jughead; Lycos; Mailing Lists; Mosaic; NCSA Telnet; Netscape; NewsWatcher; Search Engines; Software Archives; Telnet; TurboGopher; Veronica; WAIS; WebCrawler; World Wide Web

Internet Servers

See

Workgroup Servers, Macintosh Family

Internet Service Bureaus

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A lot of people thought it was pretty funny when they found out you can order a pizza over the World Wide Web. But those same people probably won't laugh when they find out you can order printing services over the Internet—they'll be too busy figuring out just how much time and money they can save.

A new category of service bureaus offers customers the ability to receive near-instant turnaround on job estimates via email. Jobs can be submitted over the Internet as well, using **ftp**. These companies offer printing, copying, and binding services similar to those offered by local quick print shops, but they only work from electronic files. **Yahoo** lists a number of such businesses under Business and Economy: Companies: Communications and Media Services: Desktop Publishing.

See Also

FTP; Service Bureaus And Printers; Yahoo

Internet, Services

There are a variety of different interfaces or protocols for locating, copying, and presenting information on the Internet.

Each Internet Service has its own **browser** or **client** software. Some services work particularly well with specific hardware configurations, such as terminals, and some specific types of data the others cannot access, such as **multimedia** files or **electronic mail** .

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Most Internet Services require a connection to the Internet that uses the set of **protocols** called **TCP/IP**, or Transmission Control Protocol/Internet Protocol. Most computers, and virtually all Macintoshes, can communicate on the Internet using these protocols with **MacTCP**.

The location of a specific document, site, or object on any of the services can be located by specifying its Internet address, called a **Uniform Resource Locator (URL)**.

The following table names and describes the various Internet services, the kinds of information they can process, and some examples of typical client software.

Internet Services

Service	Description	-	Information	-	Client Software
Electronic Mail	Widespread system of interpersonal and business communications	-	Email messages, mailing lists, newsletters, multimedia (MIME) mail	-	Eudora, QuickMail, POPmail,
Usenet	Internet discussion groups;		users subscribe to group(s) based on a topic of		

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	interest Opinions, rumors, tips, and views posted in articles; discussion occurs in article “threads” - NewsWatcher, Nuntius, InterNews
File Transfer Protocol (FTP)	Method of retrieving and transferring software, text, and other data S o f t w a r e archives, databases, libraries - Fetch, Anarchie
World Wide Web	HyperText-based graphical information interface Web sites and home pages published by educational, governmental, commercial, and nonprofit organizations as well as individuals - Netscape, Mosaic, MacWeb, TCP/Connect II
Gopher	Network of Gopher servers that present information in list-based, window-oriented format News, library catalogs, FTP sites, discussion groups, phone books - TurboGopher
Wide Area Information Servers (WAIS)	Searches many online information sources and responds to complex queries.

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	Virtually unlimited. Relates keywords and presents results using relevance feedback. - MacWAIS, HyperWAIS
Telnet	Allows a computer to connect to a computer network; uses a command-line interface to access text-based information. Library catalogs, news, weather - NCSA Telnet, Comet, TN3270, MicroPhone and other telecommunications packages.
Internet Relay Chat (IRC)	Multiuser real-time chat system - Discussion, gossip, argument, occasional celebrity interviews - ircle, Homer IRC
Multi-User Dungeon/Multi-User Dimension (MUD)	Users assume alter egos and interact in virtual environments I m a g i n a t i v e , escapist human online interactions - MacMud, MuDDweller, Meeting Space

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Internet services are by no means mutually exclusive. All the services can be accessed from your Macintosh, and they often work together. You can use your World Wide Web **browser** to send and receive **email** and run **Telnet** as a helper application, for instance. Your choice of service depends on several factors:

1. The sort of information you want to access.
2. The way you connect to the Internet.
3. The computer equipment you use.

For instance, if you want to retrieve a large amount of information in answer to a specific question or set of keywords, you might try MacWAIS to connect a **WAIS** server. If you can't get connected to the World Wide Web due to computer memory or other constraints, try **Gopher**. To gauge other computer users' reactions to a new piece of software, or to share theories and ideas on virtually any topic, connect to a **newsgroup**, read the current articles, or join in a discussion **thread**. You can also subscribe to a **mailing list** to find out more about a topic of interest. To talk to others just for fun, get on an **Internet Relay Chat** line or, if you're feeling adventurous, a **MUD**.

Internet Services, Gateways A *gateway* connects two dissimilar networks, translating information so that it can pass transparently from one to the other. BITNET, FidoNet, and UUCP networks act as mail and file gateways

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to the Internet. Gateways connect the various parts of the Internet, including some of the Internet services, to each other. In reality, though, the services aren't separate at all, but rather, different ways of accessing the same information.

Internet Services, Obtaining Most of the client software for Internet Services can be obtained freely over the Internet itself. The first step is to obtain an Internet connection from an **Internet Service Provider (ISP)**. Most providers will give you software such as Fetch that can be used to download **shareware** Web browsers or other clients via FTP.

See Also

Anarchie, Browser, Client, Electronic Mail, Fetch, FTP, Gopher, Home Page, HTML, Hypertext, Internet, Internet Relay Chat, Internet Service Provider, MacWeb, Mailing List, Mosaic, Multimedia, MIME, Multi-User Dungeon, Netscape Navigator, Protocols, Shareware, TCP/IP, Telnet, TurboGopher, Uniform Resource Locator, Usenet, WAIS, Web Page, World Wide Web

Internet Talk Radio

See

Internet Multicasting Service

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Internetwork

An internetwork has nothing to do with "The Internet". (Technically, the Internet is actually a WAN.) An internetwork is composed of multiple Local Area Networks in one geographically contiguous area that have been joined together. Interconnecting these networks allows the users from each area to exchange email and files and allows for centralized management of the individual workstations. Say you have a suite of offices, and each office has two or three Macs networked together with LocalTalk and a PhoneNet daisychain. Each office has its own LAN. If you use **bridges**, **hubs**, or some other method to join the several separate LANs together, you'll create an internetwork.

Internetworks function in a similar manner to the individual **Local Area Networks** (LANs), but they do require additional equipment to manage the flow of traffic between the individual LANs. Routers, Bridges, Repeaters and Hubs are commonly used to form the internetwork.

The interconnection of LANs spread over wide geographic areas is known as a Wide Area Network (WAN). The difference between a WAN and an internetwork is one of distance. The internetwork is still more or less local, whereas the WAN can be cross-country if necessary.

See Also

Bridge; Hub; Local Area Network; Wide Area Network

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Interpreted Language

Before any program can be executed by a computer, it must be converted from human-readable source code into **machine language** instructions that the computer can understand. Interpreted languages perform this conversion one instruction at a time as the program runs. This is in contrast to **compiled languages**, which convert source code into machine code in a single batch process before the program executes.

Interpreted languages typically incur a significant speed penalty because of the translation step that must take place before each line of code can be executed. This significant disadvantage may be outweighed by some of the advantages of interpreted languages. Because interpreted programs don't exist in machine code until they are executed, they are often much more portable than compiled programs. Provided that an interpreter exists on each type of computer, the program can be used on many different computers without change.

Interpreted languages are also capable of a much faster development time because there is no delay between making a change to some code and being able to execute that code. If the code needed to be compiled, you would have to wait for the compilation and linking to occur before you could run it. This delay may be insignificant for small programs, but for large ones it could be huge. As a result, some traditionally compiled languages are now available in special interpreted versions designed just for **debugging** .

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Although most languages can be implemented as either interpreted or compiled, some are most frequently interpreted, such as **BASIC**. In addition, most macro and **scripting** languages are also implemented using an interpreter.

Another source code conversion method straddles the line between compiled and interpreted. See the **Compiled Language** entry for a discussion of these *byte-code compilers* used in languages such as Java.

See Also

Compiled Language; BASIC; Compiled Language; Java; Machine Language

InterSLIP

Popular freeware program by InterCon that provides Serial Line Internet Protocol (SLIP) connection to the **Internet** through a dial-up **modem**. Although it is freeware, InterSLIP offers functionality equivalent to commercial programs.

To install InterSLIP, place the extension InterSLIP in your Extensions folder. A **control panel** called InterSLIP Control is available but only necessary for System 6 users. An application, InterSLIP Setup, must also be installed on your hard disk. It's a good idea to put it or an alias to it in the Apple Menu Items folder for easy access. After placing those items in the correct locations, restart your Mac. Make sure InterSLIP is selected in the main window of the MacTCP control panel, and then proceed with configuring

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InterSLIP.

The InterSLIP Setup application is used to configure your connection. Launch InterSLIP Setup, and from the “File” menu choose “New.” InterSLIP Setup prompts you for a name with a dialog box; name your configuration and click “OK.”

After creating the configuration, you must enter the correct settings for your particular modem and account. You need information from your system administrator to configure InterSLIP. (See the entry for **SLIP** for a list of questions to ask.) When you have the information, double-click the name of your configuration in InterSLIP Setup to open the configuration dialog box.

After you have entered your modem name, password, and other settings, InterSLIP is easy to operate. Click “OK” to close the configuration window. In the InterSLIP Setup window, click “Connect.” (Make sure your modem is connected and on.)

InterSLIP dials your host and signs in with a series of messages. The “Connected” message means you have connected successfully. When you are not connected, you will see the message “Idle.” As soon as you connect, the “Connect” button becomes disabled and the “Disconnect” button becomes enabled. There is no automatic disconnection, so you must make sure to click the “Disconnect” button when you’re finished using your SLIP account.

See Also

Asynchronous Data Transfers, Internet, MacPPP, Modem, Network, Packets,

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Parity, PPP, SLIP

Inventory Control Software

Businesses that are concerned with sales, rather than services, must keep an updated inventory of the products they sell, so that they know when a particular item is running low and needs to be re-ordered. **Big Business**, from Big Software, does this quite elegantly. After you enter basic information about an item and its vendor, the program tracks the sale of that item and subtracts that order from the stock on hand. The program reminds you to order “at least” a specified number of units. It also lets you know that it’s time to re-order, whenever the stock falls below a specified amount, and prints the appropriate purchase order.

Built items, items constructed from other products, are tracked as single items after they are built. A gourmet food basket, for instance, is *built* out of a basket, a box of candy, a bottle of wine, and a bag of mixed nuts. The individual box, bag, bottle, and basket are not sold separately. Prior to building the package, the components are tracked separately. When the package is assembled, the component items are removed from inventory.

Items sold as a bundle also are tracked separately. Bundled items are meant to be sold separately but are also sold together for a special price. An example might be the holiday promotion that gives you a chocolate Santa with each fruitcake you buy. The program adjusts for the bundle price and correctly

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removes one each of the items in the bundle from the inventory.

See Also

Big Business

Iomega Drives

See

Backing Up with Removable Cartridge Drives, Zip Drive

IP

See

Internet Protocol

IP Address

A four-part number that uniquely identifies a machine connected to the **Internet**. IP stands for *Internet Protocol*, the main protocol used on the Internet.

Your **Internet service provider** needs to assign you an IP address so it can route communications to and from your computer through its domain name server (**DNS**) and out to the Internet.

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IP addresses are assigned more easily recognizable domain names, which consist of two or more words. For example:

IP address: 198.137.231.1

domain name: halcyon.com

IP address: 128.135.0.0

domain name: uchicago.edu

In some cases, your Internet provider will give you a manually addressed account that has a “static” IP address; that is, one that does not change. In many other cases, the **server** will assign you an address that is “dynamic;” that is, it differs every time you connect to the Internet, depending on what IP number is available at the time.

It becomes important to know your IP address and whether it is static or dynamic when you configure your computer software to connect to the Internet. Software such as **MacTCP**, **InterSLIP**, and **MacPPP** require that you enter your IP address information in their configuration dialog boxes.

For instance, in the MacTCP configuration dialog shown in the following figure, you choose one of the buttons in the top left section to specify whether you have a Manual, Server, or Dynamically assigned IP address. In the bottom right section, you type your Internet provider’s domain name and its IP address(es).

See Also

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DNS, Internet, Internet Service Provider, Network, Server

IRC

Internet Relay Chat is a method of conducting real-time communications with other individuals on the **Internet** .

Internet Relay Chat (IRC) was developed by Jarkko Oikarinen of Finland in 1988 and has since spread around the world. Computer users connected to the Internet gather in groups called *channels*, usually devoted to a specific subject. Private conversations are also possible.

IRC is one of the most popular **Internet services** , although the communication usually amounts to little more than casual “chatting.” Parents, of course, should be aware of the potential for abuse by children who either overuse “chat” or use it to discuss “adult” topics, sometimes referred to as “Hot Chat.”

Two IRC client programs for the Macintosh are **ircle** and **Homer** . Users launch one of these programs and connect to one of several IRC servers, where they can either start a new chat channel or join one already in progress. Each channel is usually devoted to one topic, like a **newsgroup** , the difference being that on IRC the communication is instantaneous.

After the connection is made, whatever the user types is transmitted to other chatters around the world. The various messages and responses scroll by on

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the Macintosh monitor, which resembles a back-and-forth conversation.

For more information about IRC visit the IRC-Related Resources on the Internet site: <http://urth.acsu.buffalo.edu/irc/WWW/ircdocs.html>.

See Also

CU-SeeMe; Internet; Internet Services

Ircle

See

IRC

ISDN

ISDN (Integrated Services Digital Networking) is an extension to the standard public-switched telephone network that allows for telephone company customers to transmit digital data directly over the telephone wires without the use of a modem. Your Macintosh connects to an ISDN line through the use of a terminal adapter, or TA. While it's easiest to understand a TA by thinking of it as an "ISDN modem" this is technically incorrect—by definition, a modem modulates and demodulates signals from digital to analog and back to digital to allow transmissions of digital signals through the analog telephone network.

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An ISDN Terminal Adapter places digital computer signals onto the phone company's digital network. (It also does some signal filtering and conditioning, but that's a relatively minor point.) The telephone companies have made ISDN service available in many areas, although it's far from universal. It requires special switching and signal handling devices at the central office, although, contrary to some previously published information, it does *not* require fiber-optic cabling or anything other than ordinary telephone wire.

Standard ISDN service, known as PRI (Primary Rate Interface) consists of two lines (Bearer, or B-Channels), each capable of transfer rates of up to 64Kbps. Many ISDN TA's allow the two b-channels to be multiplexed together to form a single 128KBps transfer stream using protocols such as Bonding mode 1, or Multilink PPP.

It is important to understand that despite the theoretical 128K speed of a bonded ISDN connection, your Macintosh can only communicate with the TA as fast as the ports available to the Mac. For example, if you connect a TA to the Macintosh via the Modem port, older Macs cannot reliably reach speeds much beyond 38,400 bps. It's rather like driving a horse and buggy down an eight-lane superhighway. No matter what the speed limit of the road might be, the horse can't run more than about 20 miles an hour. PowerPC Macs can reach speeds of 115,000KBps, but normal Mac terminal programs require the use of Asynchronous communication, which slows down overall throughput. Even though the PowerPC "horse" runs fast, the buggy slows her down.

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To make the best use of ISDN's speed, you will need a router that features a synchronous 128Kbps WAN port. This router can then transfer data to the Macintosh through a high speed Ethernet Port. It's akin to trading in the horse and buggy for a sports car.

ISDN and Digital Telephone Lines ISDN is a service provided by your local telephone company which is now available to most businesses and schools and as well as many residential locations. ISDN provides high-speed communications as an affordable price. With the basic service more than four times faster than the fastest **modem**, ISDN makes browsing the **World Wide Web** nearly instantaneous.

Communications over ISDN is faster than modem communications over **analog telephone lines** for two reasons. First, an ISDN connection device doesn't have to convert between analog and digital signals. Second, digital signals are much simpler than analog signals, and can be sent over the lines at faster rates than analog signals with better signal quality. Digital ISDN lines don't generate the kind of static you sometimes hear on standard analog telephone lines.

ISDN includes integrated voice communication, and many **ISDN terminal adapters** let you plug in a standard telephone handset. With ISDN, you can make a voice telephone call at the same time you send data. However, most experts recommend holding on to your analog line. Unlike analog lines, ISDN lines require power to operate. In an emergency in which your building loses power, your ISDN lines will be dead while your analog lines continue to

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function.

The costs of BRI ISDN service vary in different parts of the country, but can be anywhere from \$20 to \$50 per month. There is usually a one-time installation fee as well. The cost of ISDN is more than for standard analog telephone service, but is far less than for other high-speed options, such as dedicated **T1** lines or **Switched 56** service.

ISDN Terminal Adapters When a digital ISDN line comes into your building, you need one or two pieces of hardware to connect a Mac to it. Technically, there are two devices required—an ISDN adapter and a network terminator, called an NT1. However, you will often find the functionality of both of these devices built into one piece of hardware. You can tell if a device has built-in NT1 if it has an ISDN “U” connector on it. Some devices connect a single Mac to the ISDN line, while others connect a single Mac.

An ISDN adapter device can connect to a Mac as a plug-in card that fits into an expansion slot, or as an external device that plugs into a Mac serial port. Devices that connect to serial ports are slower than cards, because they are limited by the serial port speed, which is 56Kbps in older Macs or 115Kbps in the case of the GeoPort-enabled serial ports in Power Macs. This is slightly less than the full **bandwidth** of the ISDN Basic Rate Interface (BRI), which can carry 128Kbps maximum. ISDN expansion cards can transfer data at higher rates of speed, and can also offer the use of more ISDN channels than the 3 channels of BRI. However, cards often don’t have built-in NT-1 functionality. Low-priced external devices such as the Motorola BitSURFR Pro

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and the Farallon Netopia do have a built-in NT-1.

ISDN adapters that connect to the serial port are sometimes called digital modems or ISDN modems. Some even use standard modem cables to connect the Mac. However, digital modems or ISDN modems are not actually modems at all, since there is no modulation or demodulation required for digital transmission, as there is with analog.

You can also get shared network devices, sometimes called ISDN routers, that connect to an Ethernet network and give every computer on the network access to the ISDN line. Farallon's Netopia Internet Router is a good example. These devices are the digital equivalent to shared network modems.

Most ISDN adapters come with the Mac software required to make a basic connection. There are also third-party software packages that add special functionality over ISDN, such as file transfer or video conferencing.

See Also

Analog Telephone Line; ISDN; Modems

ISO

The ISO (International Organization for Standardization) is a worldwide federation of national standards bodies from some 100 countries.

Established in 1947, the ISO is a non-governmental organization whose mission is to promote the development of standardization in the world with a

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view to facilitating the international exchange of goods and services, and to develop cooperation in the spheres of intellectual, scientific, technological, and economic activity.

ISO-9660

ISO-9660 is an international standard file system for **CD-ROMs** developed by the International Standards Organization. An ISO-9660 disc is readable on Macintosh, MS-DOS, and Windows systems, making it the ideal way of creating cross-platform discs. Unfortunately, because ISO-9660 does not support **resource forks** in files, it's not possible to place a Macintosh application on an ISO-9660 disc and have it play from the disc. If you need to place a Macintosh application on a CD-ROM that is playable on both platforms, see **Mixed-Mode CD** . It is possible to transport a Macintosh application on an ISO-9660 disc, but the application is in an encoded format that must be copied from the CD and converted before it will run. One way to encode application files is to use the **hqx** or **BinHex** format.

Because **Adobe Acrobat** (pdf) files are byte-compatible (they can be read by different operating systems without any conversion), consider using ISO-9660 to distribute them. Other file formats that are byte compatible (and are therefore ideal for distribution on ISO-9660 discs) include **MacroMedia Director** files, and of course, **ASCII** text files.

There are two slightly different ISO-9660 formats: Level One and Level Two.

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Level One is almost identical to the MS-DOS file system. Files are identified by an eight-character name, followed by a period, followed by a three-character extension. Special characters are not permitted (hyphens, plus symbols, and so on), and the letters must be uppercase. A directory does not have an extension, and subdirectories can be nested up to eight levels deep.

Level Two ISO-9660 supports filenames up to 32 characters, but in most other details is the same as the Level One. Level Two discs are not usable on MS-DOS, making it questionable whether this format should be used.

Apple provides an ISO-9660 extension for **Foreign File Access** , the System software that recognizes non-HFS CDs.

See Also

BinHex; CD-ROM; Foreign File Access; High Sierra; Mixed-Mode CD

Italic

See

Typesetting Terms

ITC Designpalette

See

Buying Fonts

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ITU-TSS

See

Modem Standards and Speeds

iWorld

See

Delphi