Microsoft Internet Explorer 3.0 (Beta) Technical White Paper

A Step Ahead

July 1996

TABLE OF CONTENTS

Overview

Introducing Microsoft Internet Explorer 3.0

Microsoft announces its next generation Web platform, Microsoft® Internet Explorer version 3.0 with ActiveX™ Technologies. The 3.0 release provides developers and Webmasters with the next generation architecture for creating active Web content and applications while providing an easy-to-use browser for end users that lets them personalize their Internet experience.

Microsoft Internet Explorer 3.0 embraces all popular Internet standards and enhances them, enabling you to create the latest, most compelling content and communicate all over the world in complete privacy.

Microsoft Internet Explorer 3.0 is a step ahead of all other Internet browsers because it enables you to:

- View the coolest and most current content--including all content that Netscape Navigator can view--communicate with the most people and personalize your Internet experience.
- Use the latest HTML tags, such as stylesheets, borderless frames, and table attributes, to author the best looking Web content which is a step ahead of the boring, static content popular today.
- Create exciting, high-impact Web content and applications with ActiveX technologies, an open, extensible architecture that lets you run thousands of software components and applications in Internet Explorer and run Internet Explorer or add Internet capabilities to applications. ActiveX's extensible design is a huge step ahead architecturally of any other browser.
- Use any scripting or programming language to create Web content or applications, including Java, Visual Basic, JavaScript and Visual Basic Scripting, Pascal, and C/C++.
- Run Internet Explorer on cross platforms, including Windows 95, Windows NT, Windows 3.x, Macintosh, or UNIX systems.
- Enrich your Internet experience with the broadest set of features of any browser, including speedy, simple email, PICs rating support that lets you restrict access to Web sites based on the appropriateness of their content, step-ahead conferencing that lets you make phone calls and share applications and data over the Internet.
- Enjoy the most advanced multimedia support of any browser, bringing rich content and fast multimedia performance to users, powerful multimedia services to developers, and broad support of industry standard media formats and multimedia HTML extensions to Webmasters.
- Customize the browser to match your personal preferences, including customizing the toolbar and favorites, QuickLinks to important Web sites, and keyboard navigation.

- Security using the Microsoft Internet Security Framework that lets you communicate privately, download code you can trust, and identify yourself to others across the Internet.

Internet Explorer Home Page

You can find out more information about and download Microsoft Internet Explorer 3.0 and its add-ons by visiting www.microsoft.com/ie/. On this page you can get answers to the most frequently asked questions about Internet Explorer, learn about its cool features, link to other pages that showcase its features, download tools that help you design and create exciting content on your own Web page, and find links to other Microsoft sites for Internet developers and Webmasters.

Standards

Microsoft is the industry leader in working with Internet standard-setting bodies. Microsoft actively participates in Internet Engineering Task Force (IETF), is a member of the Internet Architecture Board (IAB), is on the board of the International Multimedia Teleconferencing Consortium (IMTC), and works closely with the World-Wide-Web Consortium (W3C) to ensure an open, agreed-upon set of Internet standards for everyone. Microsoft appreciates and supports the W3C effort in the management of Internet standards.

More information about the W3C efforts and these new specifications, is available at http://www.w3.org. Microsoft Internet Explorer 3.0 for Windows 95 supports HTML 3.2 and follow-on standards developed by IETF and W3C.

What's New in Microsoft Internet Explorer 3.0 For Developers and Webmasters

The new open architecture for creating programmable, active content and applications for the Internet.

Creating Active Web Content

Microsoft Internet Explorer 3.0 enables the creation of an exciting, interactive Web content through its

- Integration with ActiveX technologies
- Enhancement of HTML standards
- Sophisticated multimedia advancements

Activating the Internet with ActiveX Technologies

Microsoft Internet Explorer 3.0 is the cross-platform client that delivers ActiveX technologies, an open architecture comprised of ActiveX components that are easy to create and link together. ActiveX architecture delivers true component software for the Internet, enabling you to run applications and ActiveX controls in Internet Explorer and add Internet capabilities to other applications.

Building on proven technology and incorporating broad support for Internet standards, ActiveX enables you to create a new generation of Web content and applications -- using familiar tools and techniques you already know, or using Java and other new Internet technologies.

ActiveX technology also provides the capability to:

- Run Java applets and thousands of ActiveX controls that can transform static Web sites into dynamic places that that attract and retain visitors.
- Run on cross platforms, including Macintosh, Windows and Unix.
- Use any language or script to create ActiveX content or applications that can run in Internet Explorer or in any application.
- Use great tools to create ActiveX content and applications, including Visual Basic, Macromedia Shockwave, Adobe Photoshop, Borland Delphi, and Java-enabled tools

ActiveX ™Controls

ActiveX Controls turn dull lifeless pages into animated, interactive Web environments. ActiveX Controls are software components based on Component Object Model (COM) technology, a technology that lets Webmasters and developers create live objects for Web pages or applications, using a wide variety of languages and tools.

A few of the many ways ActiveX controls can animate Web pages follows:

- Dynamically update content according to a mouse click or a specified time, or other event. For example, you can create a stock ticker that automatically refreshes its information.

- Create animation sequences, such as a button that pulses, or text that ripples.
- Save bandwidth by rendering visually rich content from tiny amounts of data. For example, you can create a colorful, graphically sophisticated bar chart to display data from a database.
- Display text an any angle. For example, create diagonal or vertical titles that save space on your Web page, or display text along a wavy path, creating visual interest.
- Run exciting high performance 2D and 3D renderings using DirectX technologies.
- Act as a front-end to databases to display project and personnel information at your company, or commercial information on a Web site.

Plus, you can reuse ActiveX control in any application that can host COM components, enabling you to extend the Internet to standalone and network applications.

Internet Explorer 3.0 ActiveX Client Architecture

As the client for ActiveX technologies, Microsoft Internet Explorer 3.0 can host ActiveX controls or function as an ActiveX control. As a host for ActiveX control, Microsoft Internet Explorer 3.0 provides services, such as Internet downloading, that other controls need. This enables streamlining of other ActiveX controls, making it easy to create and link together a variety of dynamic, live objects in your Web page.

This component architecture enables you to run other applications in Internet Explorer and run Internet Explorer in other applications. For example, you can open a spreadsheet from the Web, complete with its own toolbar, in your browser or browse the Internet from a spreadsheet application. Or, you can easily design and create a custom application for an intranet with ActiveX components; for example, you could create an application that enables employees to check their 401(K) plan for updated stock or bond information in complete privacy using standard HTML and HTTP.

ActiveX ™Scripting

With its support for Visual Basic® Script or Javascript, Microsoft Internet Explorer 3.0 provides the most comprehensive and language independent script capabilities. You can use any scripting language, such as VBScript or Javascript, in your HTML code to create interactive pages that connect ActiveX Controls, Java applets, and other software components. Plus, with ActiveX technologies, any application that is a COM container can host Java Script and VB Script.

ActiveX ™ Documents

Support for ActiveX Documents enables you to open richly formatted documents, such as a Microsoft Excel spreadsheet, directly in the browser. The application toolbar is added to the browser, enabling you to work on documents while cruising the Internet. ActiveX Documents are displayed in Web browsers by using document viewers.

Java Applets

Microsoft Internet Explorer enhances the power of Java by merging it with ActiveX technologies to make them one and the same. In fact, the Java language is one of the best languages with which to create ActiveX control. The Microsoft Just-In-Time Java compiler and will provide the fastest way to run Java applications in a Web page in the second beta release of Microsoft Internet Explorer 3.0. Using standard ActiveX

component architecture Microsoft Internet Explorer 3.0 enables you to use scripting languages to link Java applets to other ActiveX controls, giving them more power and extended functionality.

Cross Platform

Because ActiveX technology is language independent and platform neutral, you can create content and applications, using tools and programming languages, such as Java, that run on cross platforms, including Windows, Macintosh, and UNIX.

Embracing and Extending HTML

Microsoft Internet Explorer 3.0 provides the broadest support of any browser for HTML standards, enabling you to create the most sophisticated layouts and graphically interesting sites on the Web today. Support for the following HTML standards are built into Microsoft Internet Explorer:

- **Frames**. Includes borderless and floating frames. Enables you to seamlessly open several panes within the browser window, or embed a single frame anywhere in Web page where you can insert a graphic. Frames enable you display many levels of information without requiring a visitor to leave your site.
- **Stylesheets.** Enables you to create a standard design for multiple Web pages and gives you greater design control over margins, line spacing, colors, fonts and point sizes, making desktop publishing on the Web a reality.
- **Tables.** Gives you great control over how you can display text, graphics, and background colors and images in tables, making Web content more readable and visually interesting.
- **Multimedia.** Enables you to run inline sound and video in a Web page, and display text as a scrolling marquee−perfect for calling out time-critical information.

By embracing and enhancing HTML, Microsoft Internet Explorer 3.0 offers unprecedented ease of use and flexibility for developers in making their pages look cooler easier to read for users.

Advancing Multimedia on the Internet

Microsoft Internet Explorer 3.0 continues Microsoft's leadership in advancing multimedia to the Internet, and is a step ahead in bringing multimedia content to users, multimedia services to developers, and multimedia extensions to Webmasters. Microsoft Internet Explorer 3.0 extends multimedia standards on the Internet through its support for:

- The most advanced multimedia architecture on which to build Internet applications.
- Playback of all popular video, audio, and graphic media formats currently used on the Internet, and services for defining and supporting new formats as they emerge.
- Leveraging and extending existing HTML multimedia standards, including animated GIFs, in-line video, and background sounds, to bring the richest and most exciting content to Web pages.

- Providing a platform for enabling next-generation, online gaming on the Internet, building upon the proven game technologies already shipping for Microsoft Windows 95.
- ActiveMovie enables you to play AVI and QuickTime video formats, and industry-standard MPEG video and audio formats, within your Web pages. This capability to experience the richness of video and audio on the Web is based on its next-generation, cross-platform digital video technology, which provides an advanced, extensible architecture and ActiveX control.
- HTML Layout Control, extends HTML standards by giving Web authors exact control over placing objects in a Web page, and makes it possible to create rich images without using large bitmaps.

Microsoft is an industry leader in working with Internet organizations that set standards, including W3C, to define and drive the adoption of HTML extensions for multimedia to bring users richer and more compelling experiences on the Web. For example, HTML extensions first present in Microsoft Internet Explorer 2.0 for capabilities such as in-line AVI video, and background sounds, have been adopted and formerly included in the HTML specification. Microsoft is continuing to innovate and bring new multimedia capabilities to Web pages with Internet Explorer 3.0.

Securely Exploring the Internet

Using Internet security technologies, Microsoft Internet Explorer 3.0 enables you to communicate and transfer information on the Internet or intranets with the same privacy and security as in the real world. These technologies ensure secure channels to protect private communications. In addition, Internet Explorer 3.0 provides you the ability to verify your identity to a web server and to check the integrity of software that you download.

Trusted Code

You can safely download software programs with Internet Explorer 3.0 support for code signing, which enables you to identify who published the software before you download it and verify that no one tampered with it.

Secure Channels

You can safely transfer information, such as email, or conduct financial transactions without being overheard through Internet Explorer's support for SSL 2.0/3.0 and PCT 1.0 secure channel protocols.

Client/Server Authentication. Digital identifications or certificates enable you to uniquely identify yourself to web sites and access specific information. Internet Explorer 3.0's wallet technology lets you store and manage these certificates, much the same way a real wallet stores identification cards. In addition, by requesting a web server's certificate, you can verify its identity as well.

CryptoAPI 1.0

CryptoAPI provides the underlying security services for secure channels, code signing, and applications requiring cryptography. The delivery of CryptoAPI 1.0 through Internet Explorer 3.0 allows developers to easily integrate strong cryptography in applications.

What's New in Microsoft Internet Explorer 3.0 For End Users

The easy-to-use browser that personalizes your Internet experience

Communicate and Collaborate

NetMeeting
Make telephone calls to people around the world and share applications and data with them at the same time. With NetMeeting, you can chat with groups of people while sharing thoughts on a group whiteboard. Microsoft NetMeeting is the only communication software that enables groups of people share applications, allows more than two people to participate in a conference, and is based on international standards, ensuring worldwide communications.

Microsoft Internet Mail and News
Small, fast, and simply designed, Internet Mail and News lets you send and receive mail quickly on the Internet, and subscribe to your favorite newsgroups with its flexible newsreader. Its complete integration with Internet Explorer 3.0 enables you check your favorite newsgroups or send mail while you're running Internet Explorer 3.0.

Multilanguage Support
Read pages authored in many languages with Microsoft Internet Explorer 3.0 support for international character sets. In addition, within 90 days of its release, Internet Explorer 3.0 will be available in 23 languages, helping you transmit your information to people all over the world.

Personalize Your Internet Experience

Personalize Your Browser
Customize your toolbar, Favorites folder, and your start page to suit your preferences. In addition, built-in hyperlinks to important sites enable you to quickly connect and start exploring.

Accessibility
Explore the Web using your keyboard, and adjust screen fonts to the size you prefer.

Ratings
The Content Advisor feature enables parents to set access to Web sites according to the appropriateness of their content.

Administration Kit
Build a customized version of Internet Explorer for your company, enabling you to reflect the specific needs of your organization and users. With the Administration Kit,

you can set up Internet Explorer with your own proxies, custom start and search pages, and favorites folder. Plus, you can animate and add your company's logo to the toolbar.

The Microsoft Internet Explorer Family

The Microsoft Internet Explorer family of products unlocks the potential of the Internet for people at home or at work because it supports a broad range of platforms and is produced in the most languages. By providing cross-platform and international language support, Microsoft provides the best Internet browser for individuals and organizations.

Microsoft Internet Explorer 2.0 for Windows 95 is currently available in 23 different languages, including Russian, Chinese, and Hungarian, helping bring people together from all over the world. The new Internet Explorer 3.0 for Windows 95 continues to set the standard for international support by providing the ability to view Web pages created in many countries from within the local browser. Within 90 days of final release, Microsoft Internet Explorer 3.0 will be available in 23 languages. Microsoft Internet Explorer for Windows 3.1 will be available in 20 languages and Microsoft Internet Explorer for the Macintosh will be available in 9 languages.

Microsoft offers Internet Explorer for the Macintosh, Windows 95, Windows 3.1, and Windows NT platforms.

Internet Explorer 3.0 Beta for Windows 95 and Windows NT
Includes a common executable for both the Windows NT 4.0 and Windows 95 operating systems. Microsoft Internet Explorer for Windows NT 4.0 will be released within 30 days of the release of Microsoft Internet Explorer 3.0 for Windows 95. This browser includes HTML extensions for frames, stylesheets, tables and fonts, giving designers more control over layout and typography. Plus, it supports ActiveX technologies, letting application developers create ActiveX Controls that provide in-line, interactive viewing and editing.

Internet Explorer 2.0 for the Macintosh
Supports all the features of Internet Explorer 2.0 for Windows 95 and adds a number of important features, such as support for Netscape Plug-ins. In addition, it supports a richer set of dynamic cross-platform media features.

Internet Explorer 2.0 for Windows 95
Supports existing HTML standards, such as tables, while advancing HTML with new improvements such as inline video, background sounds, and marquee effects. Microsoft Internet Explorer 2.0 delivers SSL support and support for Internet shopping applications. And Internet Explorer delivers increased performance with extensions to the HTTP protocol that maintain open channels between the server and the browser.

Internet Explorer 2.0 for Windows 3.1
Supports most existing Microsoft Internet 2.0 features and will be released by the end of April 1996.

Introducing Microsoft Internet Explorer 3.0 for Windows 95

Internet Explorer 3.0 for Developers and Webmasters

The new open architecture for creating programmable, active content, and applications for the Internet.

Creating Active Web Content

Microsoft Internet Explorer 3.0 is the best browser for developers and Webmasters who want to create an exciting, interactive Web content because of its:

- Integration with ActiveX technologies, the most open, extensible Internet architecture available
- Enhancement of HTML standards to include support for frames, floating frames, stylesheets and tables
- Sophisticated multimedia advancements, including a powerful multimedia architecture, support for running popular video and audio formats, and for HTML multimedia standards.

ActiveX Technologies

The Microsoft Internet Explorer 3.0 is the cross-platform client that delivers ActiveX technologies, the most programmable, extensible, and open Internet architecture available. Embracing both Java and Microsoft's industry-standard COM technology, ActiveX preserves your investments in applications, tools, and source code while letting you create innovative Internet applications. The ActiveX Internet Explorer client is built with standard Microsoft components that have been revised to communicate to and from the Internet. These components make writing Internet applications as easy as writing applications for the operating system. Plus, you can reuse these components in your current networking and stand-alone applications, making them Internet-ready.

This open component architecture enables developers and Webmasters to create dynamic Internet content and applications because of its:

- **Open Component Model.** Using proven COM technology, ActiveX scripts, ActiveX controls--including Java applets--thousands of existing COM components, and stand-alone application can interact with each other, creating unlimited possibilities for enriching the Internet experience. This true component architecture enables you to run applications and ActiveX controls in Internet Explorer and run

Internet Explorer in applications and other ActiveX controls. For example, a database access applet can interact with a script that displays a Shockwave multimedia graphic of the data in Internet Explorer.

-
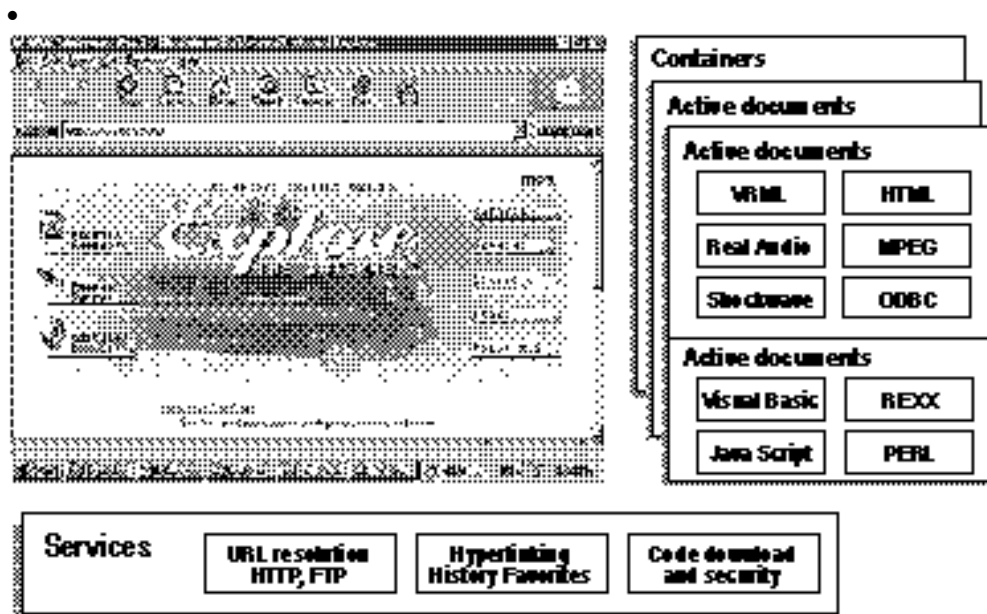
- **Figure 1** ActiveX Architecture:
- The preceding figure illustrates how the Internet Explorer frame provides services, such as navigation (URL resolution) and downloading, and hosts the ActiveX Document container. The ActiveX Document container can be embedded in other applications, such as Visual Basic, and it can host other ActiveX Documents, which include a variety of file formats, and can host ActiveX Scripting engines, such as VB Scripting and Java Scripting, which can be can be reused in other applications. The ActiveX Document container can also host ActiveX Controls, which can also be reused in other applications.
- **Application Independent Programming Model**. Because ActiveX controls and scripts are built on top of COM, they can be embedded in any application or tool. Plus, you can write ActiveX components in any programming language using any tool, including Visual Basic, Visual C++, Microsoft Office, Lotus Notes, Macromedia Shockwave, Adobe Photoshop, Borland Delphi, tools from Sybase and Borland, and Java-enabled tools. This is in contrast to Netscape's proprietary Plug-ins architecture.
- **Extensive, Independent Scripting Support**. Microsoft Internet Explorer provides the fastest, most comprehensive, language-independent scripting capability of any browser. Through ActiveX scripting interfaces, Microsoft Internet Explorer 3.0 supports scripts written in any language and has built-in support for Visual Basic Scripting and JavaScript.
- **Open Set of Services.** No longer a limited, monolithic entity, Microsoft Internet Explorer 3.0 offers a complete set of services with open interfaces. Applications can use components of the Internet Explorer client platform to retrieve data, post data, parse incoming Internet data, render HTML, render other data types, cache data, execute

scripts, and more. With ActiveX technologies, Internet capabilities are no longer restricted to the browser--applications can mix internet and desktop application functionality.

ActiveX technologies also provides built-in security services in Microsoft Internet Explorer 3.0, including support for SSL 2/3, PCT 1.0 security standards, digital code signing, and CryptoAPI. This means developers can write Internet applications that securely communicate and transmit information over the Internet and that can be safely downloaded from the Internet.

Internet Explorer 3.0 - ActiveX Client Platform

Microsoft Internet Explorer 3.0 functions both as a stand-alone container that hosts ActiveX Controls, other software components and applications, and as a set of controls (COM objects), each of which can be reused in other applications, giving them Internet capabilities. As a host for ActiveX control, Microsoft Internet Explorer 3.0 provides services, such as downloading, that other controls need. This enables streamlining of other ActiveX controls, making them easy to create and link together.

ActiveX Controls

Imagine having the power of today's applications redesigned for use on the Internet. That's what you get with the new Microsoft Internet ActiveX Controls. In creating ActiveX Controls, Microsoft redesigned OLE by leveraging those features of OLE that meet Internet computing needs while retaining basic COM technology. Small and lightweight, developers can quickly create and easily link them to other controls, including the thousands of existing ActiveX controls (including OLE controls), Java applets, and new ActiveX controls, to create a richer, interactive, faster Internet experience.

ActiveX controls can be simple display engines for data, create new user interfaces, dynamically download or create content or act as an agent to make decisions at runtime. They enliven boring static Web pages through their capability to:

- Dynamically updated themselves based on user interactions, author-specified events, or their own internal state. For example, the New Item control displays an image until a certain date, or a Timer control can animate and synchronize other controls, prompt the user after a period of inactivity.
- Solve bandwidth restrictions by rendering visually rich content from tiny amounts of data. For example, the ActiveX Chart control which can be downloaded from www.microsoft.com/ie, display colorful, data-rich charts. This is a great improvement over the IMG tag to create visually interesting Web pages.
- Display text at any angle or in an animated sequence along an author-defined path. Vertical or diagonal text can save space or create a graphically more interesting page.

ActiveX Controls can be inserted into Web pages and into any application that is an ActiveX component container (such as Visio, Visual FoxPro®, Microsoft Access) as easily as embedding graphics in Web pages. When a user accesses a Web page that references an ActiveX Control, the control runs in Microsoft Internet Explorer 3.0. If the control does not already exist on the user's computer, Microsoft Explorer 3.0 checks to see if the control comes from a trusted site through verifying its digital signature. For

more information about code signing, see the "Security" section later in this Reviewers' Guide.

Internet Explorer 3.0 Built-In ActiveX Controls
Microsoft Internet Explorer 3.0 Beta 1 includes ActiveX Controls that let you add sound and scrolling documents on your Web page.

- **RealAudio ActiveX Control.** Enables you to insert a RealAudio player right in your Web page.
- **Marquee ActiveX Control.** Enables you to insert an HTML document in your Web page and have it scroll.

ActiveX Controls Available on www.microsoft.com
With the release of Microsoft Internet Explorer 3.0 Beta 1, Microsoft is also providing the following ActiveX Control add-ons for Internet Explorer 3.0.

ActiveMovie Control
ActiveMovie delivers the next generation of cross-platform digital video technology – on the desktop and the Internet – through a set of operating system services, extensible architecture, and an ActiveX control. With ActiveMovie, you can embed all popular video and audio formats on the Web into your HTML pages, including AVI and QuickTime video formats, and MPEG video and audio, and audio formats including WAV, AU, AIFF, and MIDI. This unprecedented level of support in an Internet browser means that you have the freedom to embed the content that you want in your page - all is readily available for playback by users of Internet Explorer 3.0.

The extensible architecture of ActiveMovie enables other media formats and functionality to be supported and enhanced by Microsoft and third-parties—ensuring a rich media solution for today and the future.

For more information about ActiveMovie, see the multimedia section later in this Reviewwers' Guide and visit www.microsoft.com/imedia/activemovie/activem.htm

PowerPoint Animation Player
The new Microsoft PowerPoint® Animation Player for ActiveX makes it easy to animate a static HTML page without having to learn a complex programming language or buying expensive, complex multimedia software. Millions of PowerPoint users can now take advantage of the enhanced animation, hyperlinks, sound and special effects they are familiar with in PowerPoint for Windows 95 to create animated banners, advertisements, image maps and more.

For more information, see
www.microsoft.com/mspowerpoint/internet/player/default.htm.

HTML Layout Control
The HTML Layout Control enables you to create more compelling Web pages by providing exact, coordinate control over object layout, layering and transparency. Objects can be specifically placed within a fixed region with respect to the top and the left of the region, and also given specific height, width, and z-order attributes. The ActiveX Layout Control provides a preview implementation for incorporating these 2D regions within HTML documents for display in the Microsoft Internet Explorer 3.0. The ActiveX Layout Control creates a 2D layout format that hosts other ActiveX Controls. This Control can also take advantage of the ActiveX Control '96 specification for

transparent and windowless controls. For example, consider the following Web page as displayed in Microsoft Internet Explorer 3.0:

Figure 2 HTML Layout Control

The illustration shows a Web page created with ActiveX Layout Control. The ActiveX Layout Control pictured above hosts a number of other controls to make up the complete page. In particular, the page includes:

- **Exact 2D placement**: Controls are placed exactly where the author intended them to be placed within the 2D region. On a typical HTML page, the client Web browser determines the placement of each element; using 2D authoring and the ActiveX Layout Control, the author maintains this control, ensuring consistency of the user interface, and making it possible to create very rich images without having to use large bitmaps.
- **Overlapping regions**: The author can also specify the exact Z-order of each control on the page. In the example above, the box containing the "Breaking Grounds" text overlaps part of the larger box containing the "Good Vibrations" image. Both of these regions are overlapped by the "Volcano Coffee" logo image.
- **Transparency**: The text label "Good Vibrations" is overlapping both the background and the large shaded box in the middle of the page. The text control which implements this label is transparent, so that users can see through the text to objects underneath. Also, the cup (a Windows® metafile) is overlapped by the text label, and is itself a transparent control overlapping both the background and large shaded box. Any ActiveX Control implementing the Activ*eX Control '96 specification (published on the Microsoft Web site) for windowless controls can be transparent and used in this manner within the ActiveX Layout Control.
- **Scripting**: The ActiveX Layout Control also fully supports scripting, including both Visual Basic Script and JavaScript™. Thus, any object contained in a 2D region can script other objects in that region. In this example page, clicking on various label controls will cause the images within the region to change. Clicking on other objects on the page causes navigation—switching the

browser to a different page. In this example, this is handled with VB Script.

Cool Controls

A set of useful ActiveX controls will be built-in to Microsoft Internet Explorer 3.0 in the second beta release, including:

- **Label.**. This control displays text any angle, or renders it along an author-defined path. This is a familiar capability to desktop publishers, but to HTML authors, it is exciting and new. Vertical text or diagonal can be used to save space on the page or simply create a graphically more interesting page; or you can place text along a wavy path that jumps out, calling attention to important information.
- **Preloader**. The preloader control eliminates long download times. By initiating downloads before they are actually needed, the perceived time to load a page can be greatly reduced. Authors can also use the preloader as a gateway, preventing access to a certain page until all the material has been downloaded.
- **Timer**. Combined with simple scripts, the timer control brings Web pages to life. The timer control makes a Web page perform certain actions at certain times, including being used to animate other controls, prompt the user after periods of inactivity, initiate validation code, periodically update a floating frame and more.
- **ViewTracker**. Updates Web pages dynamically as the user scrolls through them, creating a more active Web page.
- **StockTicker**. Changes data continuously, enabling you to display stock information or other types of information that are continually updated.
- **Popup Menu**. Displays a Windows popup menu through ActiveX Scripting, enabling you create lists of choices for visitors to your site.
- **Chart.** Creates charts that display graphically and statistically complex information. The Chart control can display multiple series' of data in many different chart styles. It works with inline data or can point to text files.
- **Animated Button**. Displays frames of an AVI to create cool button behavior.

ActiveX Tools

Developers can create ActiveX Controls in any language using any tool, including a wide variety of familiar tools, such as Visual Basic 5.0, or new tools, such as Microsoft's Java development tool.

With the upcoming release of Visual Basic 5.0, developers will be able to write ActiveX Controls and convert existing VB code to ActiveX Controls with a simple point and click operation. With Microsoft's Java Development Tool, you will be able to use all the features of Microsoft Developer's Studio—a great debugger and editor, integration with COMs and Windows® APIs—to create Java applets that will run in Internet Explorer 3.0 second beta release. Plus, developers can use all the macros and documents that they write for Microsoft Office applications in Microsoft Internet Explorer 3.0.

To get a jump-start on building ActiveX Internet applications and content, developers can use the Microsoft ActiveX Development Kit (MADK). It includes all the tools and

information developers need to successfully build Internet or intranet solutions using Internet Information Server.

Webmasters can author and manage tools with Microsoft FrontPage, the easiest and fastest way to create and manage a Web site. Microsoft FrontPage comes with templates and editors that let you easily create HTML pages, including links, hotspots, tables and frames.

ActiveX Scripting

With its support for ActiveX scripting, Microsoft Internet Explorer 3.0 provides the fastest, most comprehensive, language-independent scripting capability. You can use any scripting language, such as Visual Basic Script or Javascript, in your HTML code to create interactive pages that link together ActiveX Controls (which includes Java applets) and other software components, including the different components of Internet Explorer, for example, the HTML document, the frame, or the toolbar.

This means you can create an Internet application controlled by many kinds of scripting languages. Because Internet Explorer 3.0 supports ActiveX Scripting, you can use VB Script and Javascript in your Web pages, or use another scripting languages by adding an additional DLL.

Visual Basic Scripting Edition

VB Script, which is a subset of the Visual Basic language, is a high-performance scripting language designed to create active content on Web. It enables you to link and automate a wide variety of objects in Web pages, including Java applets and other ActiveX Controls. Plus, it is fully compatible with Visual Basic and Visual Basic for Applications. Microsoft will make the VBScript source code available under license free of cost to any browser vendors and application vendors who want to support VBScript in their applications.

In addition to linking together ActiveX controls and Java applets, you can use VB Script to build pages that respond to questions and queries, ask questions, check user data, calculate expressions, and link to other applications and 3-D animations. With VBScript, developers can trap events from ActiveX Controls, invoke methods, and modify properties of ActiveX Controls.

Because VBScript code is simple to write and is always maintained in source code in the Web page, it is easy to modify. Plus, developers can enable their VBScript code to run across platforms, including Windows, Macintosh, and all major UNIX systems.

Java Scripting

Javascript, which provides the same functionality as VBScript, also enables you to create active content on Web. Microsoft's implementation of Javascript enables you to link and automate a wide variety of objects, link together ActiveX controls and Java applets, and build pages that respond to queries and calculate expressions.

ActiveX Documents

ActiveX Documents enables you to open richly formatted documents, such as Microsoft Excel, directly in the browser. Like all of ActiveX technologies, ActiveX Documents is an open, published specification available to all parties. Support for ActiveX Documents enables you to open an application, including its own toolbars, from within the browser. Internet Explorer becomes the frame in which users can browse and view these non-HTML documents. To the users, it seems as if they are running the stand-alone application

complete with toolbars, menus, and all other user interface elements, while network administrators can use existing documents on their intranet site without having to resave them all in HTML format. The Internet Explorer frame is not only an ActiveX Document host, but also packages the HTML viewer as an ActiveX Document, so that application vendors that wish to display HTML – as well as all other ActiveX Documents – can easily do so by being a host themselves.

ActiveX Documents are a set of extensions to OLE Documents, the compound document technology of OLE. The extensions are in the form of additional interfaces that allow what mostly looks like an embeddable in-place object to represent an entire document instead of a single piece of embedded content. As with OLE Documents, ActiveX Documents involve a container that provides the display space for ActiveX Documents and servers that provide the user interface and manipulation capabilities for DocObjects themselves.

HTML Web Authoring

All the cool content on the Web can be viewed in Internet Explorer 3.0 because it supports the latest HTML standards, including HTML 3.2. Plus, it is the first browser to fully implement W3C stylesheets, table tags, and borderless and floating frames. This full-scale implementation of HTML enables you to present a greater variety of information in a more interesting, dynamic format than before. A table of all the HTML tags that Microsoft Internet Explorer 3.0 supports is available on www.microsoft.com/ie/.

Enhanced Stylesheet Support

Internet Explorer 3.0 is the first commercial browser to support the W3C stylesheet standards. Stylesheets give you the same flexibility with design and layout that you have with desktop publishing programs by enabling you to attach style (for example, fonts, colors, and spacing) to HTML text tags.

By applying separate style tags to text tags, you ensure that all browsers can view the basic text and structure of your Web page while presenting more sophisticated designs for browsers that support stylesheets, such as Internet Explorer 3.0. In addition, stylesheets provide the following advantages:

- Give you greater Web page design flexibility by enabling you to control margins, line spacing, and placement of design elements, and specify colors, fonts, and point sizes.
- Enable you to apply a stylesheet to diverse documents to create a standard design, saving time and letting a company develop a signature Web style.
- Make it easier to index pages because indexing software only has to read the structural tags.

Enhanced Frame Support

Support for HTML 3.2 frame standards enables you to divide a Web page into several panes, or *frames*. Each frame displays a different HTML page, so you can display numerous levels of information without requiring the user to navigate to a different page. Microsoft Internet Explorer 3.0 is the first browser to support borderless, non-scrolling, and floating frames. This comprehensive implementation of frames gives you the following advantages when designing Web pages:

- Opening multiple frames (HTML pages) in one place enables a wholly new kind of Web page. With frames, you can create sophisticated layouts that add and mix a greater variety of sounds,

video, animation, and different background colors and patterns in one place. You can even add a bitmap to the border of a frame.

- **Figure 3** HTML Frames: Design Web pages to display information in seamless, multiple panes.

- Elimination of borders and scroll bars on individual frames enables you to create seamless sections on your Web page that can simulate and surpass the look and feel of magazine pages. Netscape Navigator's implementation of frames requires a thick, scrolling border between frames, taking up valuable space and making Web content harder to read and browse.
- Plus, with multiple frames you can organize information more effectively. For example, you can include a menu in one frame from which people can select items to view in a separate frame.
- Floating frames, an exciting new feature, enables you to embed a Web page in another Web page. While standard frames enable you to create a layout composed of several different Web pages, they also require that the Web page be divided into tiled regions. With floating frames, you can embed a frame anywhere in a Web page that you can put an image, and you specify its size and align it with the right or left margins.

Figure 4 Floating Frames: Insert a Web page into a Web Page as easily as embedding a graphic.

Enhanced Table Support

Support for the latest HTML 3.2 table tags gives you greater control over how you can display text, graphics, and background colors and images, letting you create graphically interesting , easily readable tables. With Microsoft Internet Explorer 3.0's implementation, you can:

- Assign different colors and background to cells within a table.
- Align text along a baseline.
- Specify that borders be displayed internally or externally. Before, you could only turn on or off borders for each cell and the table itself.
- Specify that a cell span more than one column or row in a table.

Netscape Navigator's implementation of tables does not enable you to add different background images or colors to cells, or align text on a baseline, limiting how you can design and organize information.

Figure 5 HTML Table Enhancements: Add background images and colors to different table cells and provide more control over aligning text and graphics with Microsoft Explorer 3.0's support for the latest HTML table tags.

Enhanced Font Support

Enables you to specify the size, face, and color of a font so that you can control exactly how your text looks. This is an important step forward in Internet publishing. Until Microsoft Internet Explorer, Web authors were either forced to deliver content as large bitmapped images, which were time-consuming to download, or just use the font selection of the browser with no guarantees of how the page would look to the user.

TrueType Font Support

Microsoft Internet Explorer 3.0 supports TrueType® font technology, which is a standard feature of both the Windows and Macintosh operating systems. TrueType provides the highest quality screen fonts available, which is critical as people read more and more information on screen from the Internet. They use anti-aliasing, which smooths out jagged fonts, and rich hinting, which makes small text more readable on screen.

Authors can specify which fonts they want to use in their HTML documents by using the <FONT> tag or CSS1 Style Sheets. Microsoft provides a set of free TrueType fonts for Webmasters to incorporate in their sites to improve readability and give them more control over the typographic image of their site. TrueType Web fonts for both Windows and the Macintosh are available free of charge on www.microsoft.com/truetype/

Microsoft is also working closely with Adobe to develop OpenType fonts, an extension to the TrueType format aimed at streamlining the management of existing fonts and the next generation.

Scrolling Marquees

Extends HTML standards by including support for the MARQUEE tag, which enables you to specify a section of text to be used as a moving marquee on a page. These eye-catching callouts are great for special sales offers and other time-critical information.

Inline Video Playback

Supports HTML 3.2 extensions that let you play AVIs on a Web page. You can specify whether the video plays immediately after people open the page, or in response to a mouse click.

Background Sounds

Supports HTML 3.2 extensions that let you play background sounds in your Web page, including sounds recorded in any of the popular formats available on the Internet today, including WAV, MIDI, AU, and AIFF. You can use background sounds to create dramatic introductions to pages, or to continually play in the background. You can specify that sounds overlap one another, or repeat in a continuous loop.

Advancing Multimedia on the Internet

Microsoft is an industry leader in bringing multimedia to the Internet. Microsoft's Internet Explorer 3.0 is a step ahead in bringing multimedia content to users, multimedia services to developers, and multimedia extensions to Webmasters through providing

- An advanced multimedia architecture on which to build Internet applications.
- Establishing and extending Internet standards for multimedia.
- Providing rich support for playback all popular video, audio, and graphic media formats currently used on the Internet.
- Building and providing a platform for next-generation online gaming.

Advanced Multimedia Architecture for Building Internet Applications

Microsoft Internet Explorer 3.0 builds on an advanced architecture of multimedia services to bring a rich, compelling experience to the user. The following figure illustrates the Microsoft multimedia architecture and shows how it integrates different multimedia services. Advanced architecture solutions, including ActiveX and DirectX technologies, give developers and Webmasters industry-leading multimedia services on which to build the next generation of Internet solutions.

ActiveX controls are at the highest level and take advantage of the lower-level services. ActiveMovie, which provides playback of digital video and audio, is an example of a service that makes use of the DirectX technology to leverage the acceleration features of the underlying hardware. The DirectX Technologies provide services by which developers can take direct advantage of hardware features to accelerate media playback (for example, 2D, 3D, animations, sound, and more), thus ensuring the highest level of performance possible.
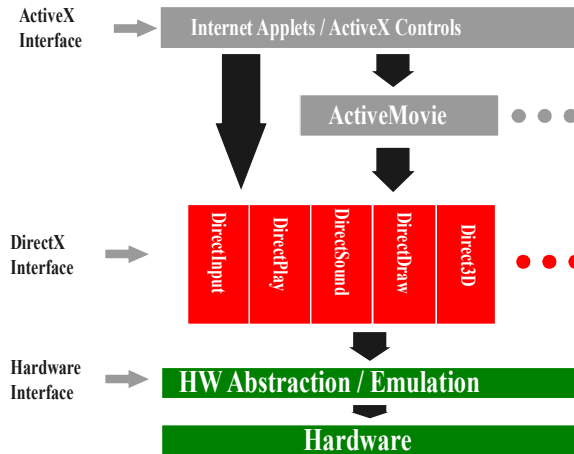
Figure 6 Microsoft Multimedia Architecture

Built-in functionality of ActiveX controls such as ActiveMovie brings next generation multimedia to your Internet browser, and support of ActiveX by third-parties brings additional innovative multimedia solutions to your desktop.

Microsoft DirectX Technologies

The DirectX APIs are a set of technologies designed to provide software developers with a direct interface to hardware, while freeing them from device-specific hardware dependencies. Designed as thin API layers, the DirectX APIs give performance-sensitive developers access to as much performance as the hardware can deliver, plus the advantages of device independence — such as lower testing costs, lower support costs and support for a broad base of hardware. The widespread support for DirectX by providers of display adapters, sound cards and input devices lets software developers harness the power of advanced multimedia hardware and deliver new levels of realism and excitement to their customers, while boosting customer satisfaction. Internet applications and ActiveX controls utilize the DirectX APIs for low-level drawing, rendering, audio playback, or interacting with the user. Virtually every hardware manufacturer in the industry that has accelerated hardware for the PC is supporting DirectX for giving developers access to that hardware.

The DirectX family consists of the following APIs:

- **DirectDraw** accelerates 2-D graphics by providing direct manipulation of video display memory, hardware blters, hardware overlays and page flipping.
- **Direct3D** brings interactive, real-time 3-D graphics services to mainstream PCs, providing software-based rendering and transparent access to 3D hardware acceleration.
- **DirectSound** provides low-latency sound playback and mixing, hardware acceleration and direct access to the sound device.
- **DirectInput** provides low-latency support of analog and digital joysticks, along with support for alternate input devices, for user interaction. Extended capabilities also provide support for rudder pedals, flight yokes, steering devices, virtual-reality headgear and other devices. Each device can use up to six axes of movement, a point-of-view hat and 32 buttons.

- **DirectPlay** provides easy and consistent connectivity between applications over the Internet, via a modem, local area network link, or other communication connection.

The DirectX APIs are built on a hardware abstraction layer (HAL) that insulates the developer from device-specific dependencies in the hardware. A companion to the DirectX HAL is the hardware emulation layer (HEL). The DirectX HEL provides software-based emulation of features not present in hardware, thus ensuring that the services of the APIs are always available to developers. The following figure illustrates how the DirectX APIs use the DirectX hardware abstraction and emulation layer to access hardware services.
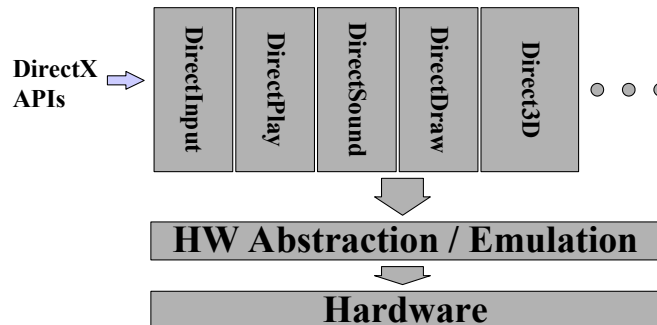
Figure 7 DirectX APIs

Services are provided as part of the DirectX APIs to query the device and performance characteristics of the underlying hardware, providing information on the capabilities supported. This information allows developers to change the behavior of the application to match the feature set of the hardware as appropriate, helping to ensure the best computing experience for the end user.

Direct3D

Direct3D is the next generation of real-time, interactive 3-D technology for mainstream PC users on the Internet and the desktop. The Microsoft® Direct3D™ API is a complete set of real-time, 3-D graphics services that delivers fast software-based rendering of the full 3-D rendering pipeline (transformations, lighting and rasterization), transparent access to hardware acceleration, and a comprehensive, next-generation 3-D solution for mainstream PCs. API services include integrated high-level retained-mode and low-level immediate-mode APIs and support for other APIs to sit on top of Direct3D to access 3-D hardware acceleration. Microsoft and third-parties will utilize Direct3D to bring exciting 3-D solutions to the Internet that immerse the user with animation or into virtual worlds.

Direct3D is fully scalable, enabling all or part of the 3-D rendering pipeline — including geometry transformations, lighting and rasterization — to be accelerated by hardware. Direct3D provides access to advanced graphics capabilities of 3-D hardware accelerators, including z-buffering, anti-aliasing, alpha blending, mip mapping, atmospheric effects, and perspective-correct texture mapping. Tight integration with DirectX™ and ActiveX™ technologies allows Direct3D to deliver next-generation 3-D graphics capabilities, including video mapping, hardware 3-D rendering in 2-D overlay planes and even sprites — providing support for seamless use of 2-D, 3-D graphics, and digital video, in Internet content. Integration with ActiveMovie allows developers to create ActiveX controls for animation that take video streams from sources including MPEG, .AVI video, QuickTime® and map video frames as textures to 3-D objects in

real time. This allows for some exciting and new ways to present multimedia content to the user.

More than 80 leading software developers, hardware vendors and PC manufacturers have already pledged their intent to deliver products for Direct3D. This support establishes Direct3D as the leading specification for the industry and ensures that users will soon experience more compelling and powerful 3-D graphics on the Internet and when using games, education and business applications. A complete list of companies supporting Direct3D is available on the Internet at http://www.microsoft.com/imedia.

Additional information about Direct3D is available on the Internet at http://www.microsoft.com/imedia.

Microsoft ActiveMovie

ActiveMovie delivers the next generation of cross-platform digital video technology – on the desktop and the Internet. ActiveMovie provides a universal playback mechanism for video or audio streams through an extensible architecture that exposes all elements of the media stream. This open architecture gives developers and content producers unparalleled flexibility to manipulate and enhance the media rendering process. ActiveMovie uses and is integrated with Microsoft's DirectX technology, automatically accelerating video playback on DirectDraw™ API-compatible graphics cards, and making possible stunning special effects and combinations of 2-D and 3-D elements with digital video.

Not just an evolutionary step from Video for Windows, the ActiveMovie video and audio playback software is founded on a fundamentally new media streaming architecture. This enables the routing of multimedia data streams through a system of plug-in components called *filters* connected in a configuration called a *filter graph*. These modular filter components make the ActiveMovie streaming media architecture very flexible and easily configurable—much more so than the monolithic architectures of Video for Windows or QuickTime. Software developers can quickly add functionality to an existing ActiveMovie configuration by writing and interconnecting a sequence of filters. Support for a new media format with ActiveMovie is as easy as providing a corresponding filter that understands the details of the data – it's that easy.

For developers, ActiveMovie services are exposed via a set of APIs. For content producers and higher-level developers, ActiveMovie includes an ActiveX control for embedding in Web pages with Internet Explorer 3.0 as well as for use in any OLE client application (e.g., Microsoft Word or Excel). The combination of ActiveX and DirectX technologies enable developers and content producers to create experiences never before possible over the Internet.

More than 20 industry companies have announced support for ActiveMovie, including the OpenMPEG consortium (representing 32 companies), and the Japanese Open MPEG Windows® Forum (representing 32 companies). This support signals that ActiveMovie will be a key API and solution for the next generation of digital video on the desktop and the Internet.

Additional information about ActiveMovie is available on the Internet at http://www.microsoft.com/imedia.

Microsoft ActiveMovie Streaming Format

The ActiveMovie Streaming Format (ASF) is an open and extensible data-independent format for archiving, annotating, indexing and transmitting synchronized multimedia

content. More specifically, ASF allows multiple data objects (for example, audio, still images, and URLs) to be combined and stored into a single synchronized multimedia stream. ASF data is network transport neutral and can be transmitted over a variety of industry standard protocols and networks, including TCP/IP, UDP, RTP, IPX/SPX and ATM. ASF addresses a number of important issues in multimedia-content storage and transmission, such as efficient packetization for multiple network transports, a flexible timing model, support for multiple bit rates, error correction and concealment, and the ability to support future media types through dynamic extension. Because ASF files can be streamed, playback of these files can begin immediately.

The ActiveMovie add-on toolkit contains a streaming format editor that enables developers to create rich multimedia content specifically targeted toward the Internet and intranet environments. For example, ActiveMovie Streaming Format content created with the toolkit can be stored on any HTTP server and incorporated in HTML Internet and intranet Web pages. More than 50 leading multimedia, content provider, tools and Webmaster companies have announced plans to support the ActiveMovie Streaming Format. Some of these major companies include Adobe Systems Inc., Aimtech Corp., Aspect Computer Pty Ltd., Asymetrix Corp., Avid Technology Inc., Macromedia Inc., Progressive Networks, Gold Disk Inc, Xing Technology, and VDONet.

Additional information about ActiveMovie Streaming Format is available on the Internet at http://www.microsoft.com/imedia.

Rich Built-in Support for All Popular Video, Audio, Graphics Media Formats on the Internet
Web pages come to life with rich support of integrated multimedia functionality in Internet explorer 3.0, making it the best browser for viewing all popular media formats for video, audio, and graphics on the Internet. With built-in support for Microsoft's next generation digital media technology, ActiveMovie, you'll never have to wait to download a separate media player or launch a separate helper application to see video, or play audio, over the Internet.

Whether embedded in Web pages via standard HTML commands, or linked to Web pages, an unprecedented level of media playback support is provided in Internet Explorer 3.0. In addition, the flexible architecture of leading edge technologies like ActiveMovie means that new and emerging media formats can be quickly supported without having to get a new version of the browser or plug-in application.

Video
Microsoft is leading the industry in bringing digital video playback to your desktop over the Internet. With Microsoft's ActiveMovie, support for popular PC formats including .AVI video, and QuickTime, is just a page or Web site away. But Internet Explorer doesn't stop there. Support in ActiveMovie for software-based playback of MPEG video means that you can play television-quality video on your PC. MPEG video files are typically smaller than .AVI or QuickTime files due to a higher level of compression, thus decreasing the time to download video over the Internet, but can also be higher quality than .AVI or QuickTime files.

MPEG (Motion Pictures Experts Group) is an open, industry effort that works in conjunction with the International Standards Organization (ISO) to generate standards for digital video and audio compression. This standard involves a highly efficient compression technique to reduce the size of video and audio segments, while still retaining high quality. MPEG formats are an industry standard for digital video, and

serves as the basis for the digital video and audio stream used by home digital satellite systems, as well as the emerging DVD (Digital Video Disc) player technology. With Internet Explorer 3.0, ActiveMovie delivers MPEG-1 video and audio playback, and Microsoft has conducted technology demonstrations of MPEG-2.

Audio

Whether for emphasis or as background effects or music, support for audio embedded in Web pages is made easy with Internet Explorer 3.0. Support for all popular audio formats including .WAV, MIDI, AU, and AIFF is provided. In addition, support for MPEG audio compression enables a high-level of compression (for smaller audio files) and the delivery of CD-quality audio files.

Traditionally, there is a tradeoff between audio quality and file transfer size – if you want a smaller file size, you have to give up some quality. However, MPEG audio provides a high level of compression, while still retaining a very good level of quality.

Graphics

Internet Explorer 3.0 supports a variety of graphic formats for displaying images within an HTML page, including JPEG, GIF, BMP, and more. In addition, support of animated GIF files provides a simple mechanism for 2D animation.

For 3D, Microsoft has been leading the way to make 3D on the Internet a reality. With the release of Direct3D comes an industry standard API and services for interactive, real-time 3D graphics on the desktop. Direct3D also defines a way for developers to transparently access hardware acceleration to speed up the graphics rendering process, and to enhance the quality of the 3D scene—this common device driver model is supported by virtually every hardware vendor doing mainstream 3D graphics hardware. Internet application developers are utilizing Direct3D, and the other DirectX APIs, to create next generation multimedia solutions for the Internet.

Microsoft is committed to continuing to support industry standards and popular media formats. Internet Explorer 3.0 will provide support for VRML 1.0 in the final product. In addition, Microsoft will be supporting VRML 2.0 and offering browsing support via an ActiveX control for use with Internet Explorer 3.0.

Platform for Next Generation On-line Gaming

Games are more fun if they can be played against real players, and the personal computer has richer connectivity options than any game platform in history. Microsoft's DirectPlay API, an extension of the popular DirectX multimedia API set, brings multi-player gaming to the Internet. DirectPlay continues Microsoft's aggressive initiative to offer leading-edge tools for the Internet and for gaming on the Windows platform. DirectPlay enhances the social aspect of gaming and enables the creation of vibrant, on-line gaming "communities."

Using Microsoft Internet Explorer 3.0, players can connect to Internet-based "lobby servers" to find opponents on-line and organize or join games. DirectPlay games can be Web-based, delivered as ActiveX controls, or can be high-performance, stand-alone Internet applications. Internet Explorer is the launch pad for finding and playing games on-line.

DirectPlay is the key part of Microsoft's Internet Gaming Architecture initiative, announced at the Computer Game Developers' Conference in April 1996. In addition to the DirectPlay APIs, Microsoft is developing on-line Game Servers and Lobby Servers, and is working with leading Internet service providers and on-line services to provide

on-line gaming functionality. Components of DirectPlay for the Internet have already been released in alpha form to selected developers as a preliminary development kit (PDK). DirectPlay will be widely available to game developers and service providers as a standard, open API.

ActiveX Technologies Server Side

Microsoft Internet Explorer 3.0 is fully integrated with ActiveX technologies for servers, including integration with the Microsoft Internet Server API (ISAPI), which allows Webmasters and developers to easily extend Web servers in a fast and scaleable manner, and with Internet Database Connection, which allows you to insert database capabilities into Web pages. For more information about the Microsoft Internet Server and its integration into ActiveX technologies, visit //www.microsoft.com/infoserv/

Secure Channels

With a built-in set of Internet security technologies, Microsoft Internet Explorer 3.0 lets you communicate privately, download code you can trust, and identify yourself to others across the Internet. This means you can conduct transactions and participate in consumer services on the Internet with the same privacy and security as in the real world.

The following security technologies are supported in Internet Explorer 3.0.

- **Trusted Code** enables you to safely download software or software components, such as ActiveX Controls.

-
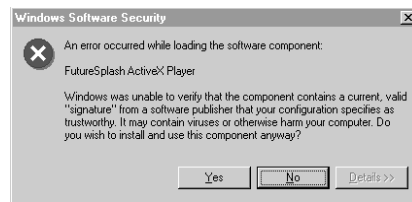
- **Figure 8** Microsoft Internet Explorer checks to see if software or software components are authentic before you download them from the Internet.
- **Secure Channel Protocols**, including Secure Sockets Layer 2.0/3.0 (SSL), Private Communication Technology 1.0 (PCT). These protocols create a secure channel, which enables you to communicate on the Internet or intranets without being overheard.

    Client/Server Authentication. Plus, you can use your digital identification or certificate to uniquely identify yourself to web servers and access specific information. Internet Explorer 3.0's wallet technology lets you store and manage these certificates, much the same way a real wallet stores identification cards. In addition, by requesting another party's certificate, you can verify their identity as well.
- **CryptoAPI** provides the underlying security services for secure channels and code signing. The delivery of CryptoAPI through Internet Explorer allows you to easily integrate strong cryptography in your applications.

Trusted Code
Microsoft Internet Explorer 3.0 supports code signing, which provides accountability, similar to that of shrink-wrap around a software box, for downloading software and software components from the Internet. Unlike retail software, software distributed on the Internet today is largely anonymous. You cannot be certain who published the software and whether it was tampered with after it left the software provider. Internet Explorer 3.0 lets you identify who published the software before it is downloaded and verify that no one tampered with it.

- **Open.** Microsoft's implementation of code signing supports existing certificate standards, X.509 certificate format, and PKCS #7 signed data standards. This commitment to supporting security standards is also evidenced by Microsoft's recently submitted

code signing proposal to the World Wide Web Consortium (W3C).

- **Software Publishing Certificate program.** Microsoft is working with industry-leading certification authorities such as Verisign and GTE who will issue certificates, based on standard X.509 and PKCS #7 formats, which software publishers can use to digitally sign their code. Tools for code-signing are available through the ActiveX SDK, and will be integrated into Microsoft and leading third-party development tools.

-

- **Figure 9** Software Code Certificate

Secure Sockets Layer 2.0/3.0 (SSL),
Private Communication Technology 1.0 (PCT)

Support for SSL 2.0/3.0 and PCT 1.0 ensures that your personal or business communications using the Internet or intranets are private. The SSL and PCT protocols create a secure channel, so that no one can eavesdrop on your communications. With secure communications guaranteed, you can send email, buy consumer goods, reserve airplane tickets, or even conduct personal banking on the Internet.

Client authentication. Client authentication lets you present your digital identification or certificate to Web servers that request it. This means that you can verify your identity across the Internet and access services that you have subscribed to. Internet Explorer 3.0 also supports the use of multiple certificates for different Web sites.

Internet Explorer stores certificates or digital identifications much the same way a wallet stores identification cards, thus simplifying how you access Internet services. For example, if you subscribe to an online sports service, you must type your user name and password before you can access information. Support for digital identifications allows this sports service to request your certificate and validate your identity. In future versions, the Microsoft Wallet will also store a wider variety of personal information such as credit card numbers, passwords, or private keys.

Server authentication. Server authentication ensures that you are communicating with your intended party. In addition, you know that only the sender of the message could have sent the message, and the message has not been altered in transit. For example, if the sports service sends you email, you can verify that it is, in fact, the service sending you the mail, and not someone who intercepted it.

Microsoft is working with Netscape and others, as part of the Internet Engineering Task Force (IETF) Transport Layer Security working group, to create a unified, standard secure channel protocol.   Microsoft has written a discussion draft that combines the best features of SSL 3.0 and PCT 2.0, using SSL 3.0 as a base and adding features from PCT 2.0 based on feedback from cryptographers and implementers.

CryptoAPI 1.0

CryptoAPI, the foundation of the Microsoft Internet Security Framework, provides the underlying security services for secure channels and code signing. The delivery of CryptoAPI 1.0 through Internet Explorer 3.0 allows you to easily integrate strong cryptography in your applications. Cryptographic Service Provider (CSP) modules interface with CryptoAPI and perform functions including key generation and exchange, data encryption and decryption, hashing, digital signatures, and signature verification. Internet Explorer 3.0 will install the Microsoft RSA Base Provider CSP on Windows 95.

CryptoAPI 2.0, scheduled for beta release in third quarter of 1996, will provide high level APIs for authentication, signing, and encryption and decryption services as well as a complete public key infrastructure. With this infrastructure, your applications can take advantage of certificate management functionality such as requesting that a certificate be created, stored, or verified.

- **Extensible security.** CryptoAPI isolates the application from the CSP modules and allows different CSPs to be used without modifying application code. CryptoAPI allows vendors to develop and efficiently deliver strong encryption CSPs to customers to the maximum extent allowed by existing law.
- **Open.** CryptoAPI's open architecture allows you a choice of CSPs. CryptoAPI will also be made available across the Windows, Macintosh, and UNIX operating systems. In addition, CryptoAPI 2.0 will support the following standard certificate formats: X.509 version 3, ASN.1, and DER.
- **Leverages existing skills and solutions.** CryptoAPI lets you use your existing programming expertise to incorporate cryptography in applications or existing solutions.

Commitment to Internet Standards

This set of security technologies, which is part of the Microsoft Internet Security Framework, supports Internet standards such as X.509 and PKCS#7 certificate formats. In addition, Microsoft actively participates in the Internet Engineering Task Force (IETF), World Wide Web Consortium (W3C), and other groups to develop Internet security standards. Recent Microsoft security initiatives include the code signing proposal submitted to the W3C and the Transport Layer Security (TLS) efforts through the IETF, aimed at creating a single secure channel standard.

Internet Explorer 3.0 for End Users

Microsoft Internet Explorer 3.0, the next generation Web platform, is now available. Internet Explorer's easy interface and customizable toolbar make browsing a breeze. Its customizable start page brings up-to-date news, links, and cartoons to you daily. Internet Explorer contains security and ratings technology you can trust to protect your data from intruders and help you choose appropriate content for your children. Plus, it supports all the newest HTML standards so you can view all the latest content on the Web.

Communicate and Collaborate

Microsoft Internet Explorer 3.0 enables you to communicate and work with people all over the world through the most complete suite of communication tools available, including built-in e-mail, newsreading, and conferencing clients. They simplify the task of international communications because they are based on international, open, industry-backed, T.120/H.323 standards. Plus, Microsoft Internet Explorer 3.0 breaks international language barriers by providing support for reading pages authored in other languages.

Multilanguage Support
Within 90 days of its release, Internet Explorer 3.0 will be available in 23 languages, helping you send your information to people all over the world. Plus, you'll be able to read pages authored in almost any language. Today, with most browsers, if you try to view a page authored in any of the Japanese language forms, it is illegible. Microsoft Internet Explorer 3.0 solves this problem by letting you select the character set of the authored language, enabling you to view the content correctly.

Microsoft Internet Mail and News
Small, fast, and simply designed, Microsoft; Internet Mail and News is the easiest way to send and read electronic mail and news on the Web. The new SMTP/POP3 mail client enables you to work online, sort and store mail any way you'd like, and view messages quickly in the preview pane. The new newsreader enables you to connect to multiple mail servers, automatically decodes binary files, and supports the same preview pane and filtering offered by the mail client.
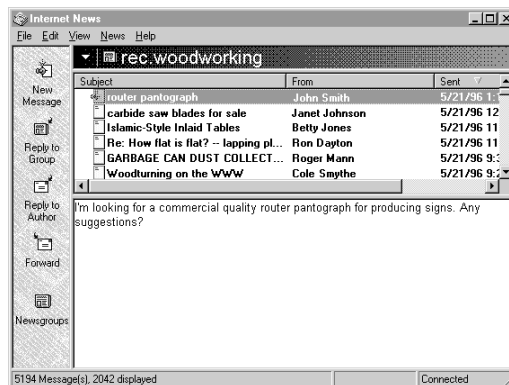
Figure 10 Microsoft Internet Mail and News provides Internet email and newsgroup capabilities.

Microsoft Internet Mail. This simple yet powerful client uses Internet-standard SMTP and POP3 protocols to let users send and receive Internet e-mail through their Internet Service Providers' mail servers. An easy-to-use toolbar provides access to the most commonly used e-mail functions. In addition, Microsoft Internet Mail provides the following features:

- Full support for Internet standards, including SMTP/POP3 and MIME
- The ability to sort mail on a variety of columns, and configure the columns used to display messages
- The ability to organize messages in folders and easily move them to and from the file system
- Spell-checking of mail if Microsoft Office 95 spell checking is installed
- Remote usage and online usage
- A preview pane for easy reading of messages
- Ability to personalize your mail with automatic signatures
- An address book to enables you to keep commonly used e-mail addresses at your fingertips

- **Microsoft Internet News.** This Internet newsreader supports full participation in Internet newsgroups, enabling you to easily subscribe, post, and read messages on Internet USENET newsgroups and intranet discussion groups.

- Microsoft Internet News shares the same user interface as the Internet Mail client, including the preview pane and folder hierarchy, with additional options specific to newsreading. It also offers high performance and support for multiple simultaneous news servers. In addition, Internet News offers the following features:

- Full support for Internet NNTP standards
- Ability to subscribe to your favorite newsgroups for easy access.
- Conversation threads displayed to help you easily follow a topic
- Ability to subscribe to your favorite newsgroups for easy access
- Ability to switch between your favorite newsgroups with a single click of the mouse
- Automatic decoding of binary attachments
- Ability to personalize your messages with automatic signatures
- Caching of messages and headers for great performance
- The ability to read news offline (coming soon)

Microsoft NetMeeting
With Microsoft NetMeeting, you talk on the phone to anyone anywhere in the world and share data at the same time. It brings all the capabilities of a shared computer connection to a common telephone call.
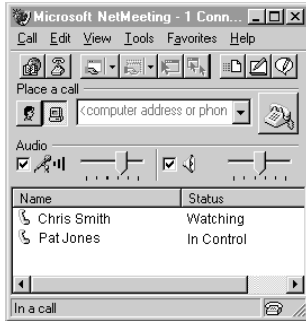
Figure 11 Make a telephone call on the Internet with NetMeeting

⏺Try This:

If you are going to use Microsoft NetMeeting on the Internet, type uls.microsoft.com when NetMeeting asks you for the conferencing server name.

Click the directory button and then select the person you want to call.

If you are going to use Microsoft NetMeeting on an Intranet, click the address button and type the machine name, ip address, or modem phone number of the person you would like to call.

While you're talking on the phone over the Internet, you can also share data with the people you're talking to in the following ways:

- **Share applications.** You can open an application on one computer and share it with all connected computers even when the connected computers do not have that application installed. For example, you can share a Microsoft Word document with three co-workers. Each person now sees an image of your program on his or her computer. You can review the document together and take turns editing.
- **Transfer files.** Use the same modem connection to transfer files without interrupting the conversation.
- **Chat area**. Type messages in your own private chat room. Perfect for online meetings on an Intranet or an online social gathering on the Internet.
- **Draw on a whiteboard.** Brainstorm ideas or sketch out a design by opening a whiteboard on all connected computers. The whiteboard comes with drawing and text tools, which you can use to sketch an organization chart, draw a diagram, type action items, and perform similar tasks. You can point out your co-workers' errors by using a remote pointer or highlighting tool, or take a "snapshot" of a window and then paste the graphic on a page.
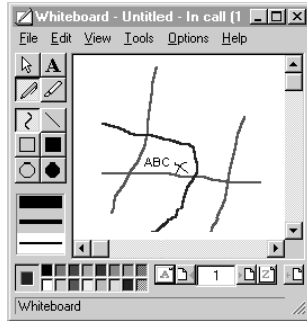
-
- **Figure 12** Draw on a shared whiteboard while talking.

Try This:

1. On the NetMeeting Tools menu, click Whiteboard.

2. On the Tools menu, click Pen.

3. On the Option menu, click one of the drawing tools, and start drawing.

You can also host just a voice conference or just a data conference. On an intranet, you might have the voice connection over the office phone system and the data connection over the LAN.

NetMeeting adheres to major international standards from both the International Telecommunications Union (ITU)and the Internet Engineering Taskforce, to guarantee broad interoperability between applications and across platforms. For example, you can share a whiteboard between different applications on different platforms thanks to support for standard protocols such as the ITU's T.120.

NetMeeting also supports "multi-point" connections, which allows more than two people to join in conversations. Voice conferencing is currently limited to connections between two points, but up to five points for data conferencing, and even more simultaneous users through network-based conferencing services. It includes a tool for connecting to and scheduling the use of network-based conferencing services.

Personalize Your Browser

Though the Internet provides great promise as an exciting new communications tool, many people cannot reap its benefits, for simple reasons. Research shows that new users still find it too difficult to connect, navigate, download, and communicate on the Web. Microsoft Internet Explorer 3.0 removes the mystery from getting up and running on the Internet. Improvements to the toolbar reduce the confusion about downloading, and pre-loaded favorites quickly link you to cool sites.

Plus, you can customize your toolbar, Favorites folder, user preferences, and start page to personalize your experience of the Web, making it match your personal characteristics and preferences.

Personalize Your Browser

Customizable Toolbar
You can change the size of the toolbar by dragging the Address bar or the Quick Links button up or down, or to the left or right, to remove or display them. Independent

software vendors can customize the toolbar by putting their own graphic on the toolbar, adding their sites to the Quick Links button, and adding their own start and search pages.
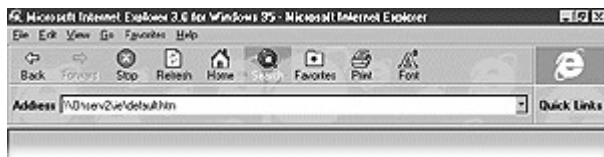
Figure 13 Toolbar with Address Bar

Figure 14 Toolbar without Address bar and compressed buttons

Figure 15 Toolbar with Expanded QuickLinks

Customizable Start Page
Enables you to customize the Microsoft Network home page (www.msn.com) to reflect your personal preferences. You can set the MSN home page to retrieve and update the latest information about your favorite stocks, cartoons, news, sports and more, including the following:

Favorite Links	Weather	Ski Reports
Search Engines	News Services	United Media Comic Strips
Ziff-Davis Computer News	Music Clips	Movie Links
Stock Quotes	Sports Scores	TV Listings

Figure 16 Customizable MSN Home Page (Will add Explorer)

Customizable Quick Links

Microsoft Internet Explorer 3.0 comes pre-loaded with cool Web sites to help people easily connect to the Web. Plus, people can select Web sites to automatically dial into and update the content of their cached sites. The next time they run Internet Explorer 3.0, the sites will have already been updated. In addition, Web authors and developers can edit the registry to include their own pre-loaded links.

Customizable Internet Ratings

Many people are hesitant to browse the Web because of security concerns. They want assurances that children cannot visit sites that display inappropriate information. Microsoft has been working closely with the Platform for Internet Content Selection (PICS) committee to help define standards for rating Internet content.

Microsoft Internet Explorer 3.0 is the first browser to support the PICS standard, which enables you to control access to rated Web sites, or use third-party rating bureaus (see PICS specification for more details, at http://www.w3.org/pub/WWW/PICS) to control the types of content you want to see. By choosing different levels of allowable language, nudity, sex, and violence, you can filter out unwanted sites, effectively blocking users from being able to access objectionable material. Parents or supervisors can set passwords to allow access to any Web site, and you can block users from being able to access Web sites that aren't rated.
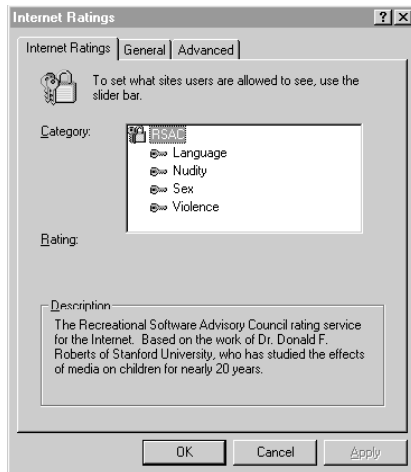
Figure 17 Set access to Web sites based on their content.

Internet Explorer 3.0 reads special tags placed on pages by Internet content providers to determine whether that page meets your criteria for what types of content should be displayed. Web site authors can obtain a rating from the Recreational Software Advisory Council (RSAC), the organization that created and now maintains these ratings. RSACi distributes these PICS tags from their Web site (http://www.rsac.org).

These ratings are based on the PICS technology for defining and creating rating systems. RSAC used the PICS "language" to define it's rating system. Rating can be generated by both the Web site managers and independent bureaus. This way, parents have a choice of which rating system best meets their needs and preferences.

Try This:

1. On the View menu, click Options, and then click the Ratings tab.

2. Type a supervisor password that determines who can set the ratings.

3. Set the level of ratings you would like in each of the following categories: nudity, language, violence, sex.

Internet Explorer Administration Kit

You can build a browser for your company with the Internet Explorer Administration Kit (IEAK) The IEAK enables organizations to create and distribute a Web browser that reflects the specific needs of their organizations and end users. A simple wizard guides corporate administrators or ICP/ISP distributors through the steps necessary to create self-installing versions of Internet Explorer that automatically configure a complete internet solution. For corporate environments this includes configuration of proxy, internet mail and news, and custom start pages, search pages, and Favorites folders.

This cross-platform solution supports the creation of master network installation files, floppy disk, and CD-ROM versions of Internet Explorer 2.0 for Windows 95, Windows NT® Workstation, and Windows 3.1. Future releases will also support IE 3.0 for Windows 95 and the Apple® Macintosh® platform.

In addition, the CD-ROM version enables you to customize the background graphic and title bar of the installation application. The CD-ROM version also includes the popular Microsoft Office Viewers and Internet Assistants for Microsoft Word, Excel, and PowerPoint®, and the Microsoft Virtual Reality (VRML) add-in.

The IEAK is available at no cost to organizations who have a fully executed Microsoft Internet Explorer distribution agreement and comply with the Microsoft Internet Explorer usage guidelines. For more information, or to download the IEAK, see http://www.microsoft.com/ie

Manageable Favorites and History

With Microsoft Internet Explorer 3.0, you can easily manage your favorite sites and the history of sites you have visited because they are stored as shortcuts in standard Windows 95 folders. You can organize and categorize them, enabling you to easily share them with other people. Internet Explorer displays the contents of these folders as cascading menus off the Favorites menu.

Because Favorites and History are shortcuts, you can easily apply all the standard file operations, such as copying and deleting, to them. You can also use the Find command in Windows 95 to search for a particular shortcut. With Windows Explorer, you can sort them alphabetically, or by last accessed date, or other criteria.

You can also mail a favorite shortcut to someone else by copying it into a mail message. Plus, you can use that shortcut as part of a signature file, so that people reading your message could double-click your shortcut, and go automatically to your WWW site.

 Try This:
1. From the favorites menu, choose Open Favorites.
2. When the Favorites folder appears, right-click the folder icon in the upper-left corner of the window. You should see a shortcut menu, enabling you to search, share, and explore this folder, and more. This is a convenient way to search a large tree of favorite places, using the default Windows 95 search engine to find the site you want.

Netscape Bookmark Conversion Tool

When you install Microsoft Internet Explorer 3.0, it automatically converts all Netscape Bookmarks into shortcuts in your Favorites folder.

Quick Start

Microsoft Internet Explorer 3.0 gets you up and running on the Web quickly by providing an Internet Sign-up wizard that guides you through the process of connecting to the Internet.

Internet Sign-up Wizard

The Internet Sign-Up Wizard handles all facets of getting connected to the Internet, including configuring your computer to communicate on the Internet and selecting an Internet access provider. All you have to do, is click the Internet icon on your desktop to start the Internet Sign-up Wizard. The wizard dials a server that contains sign-up information for many popular Internet service providers, reducing the whole sign-up and setup procedure to nothing more than typing your name and address, selecting a payment method, and swapping disks.

To start Internet Explorer, just double-click the Internet icon on the Windows 95 desktop. To try the Internet Setup wizard, click the Start button, point to Programs, point to Accessories, point to Internet Tools, and then click Internet Setup Wizard.

Easy to Learn

Using Microsoft Internet Explorer 3.0 is natural for Windows 95 users. Internet Explorer 3.0 uses familiar Windows 95 technologies, such as shortcuts and drag-and-drop, to minimize the amount of new terminology and operations that you have to learn.

Its user-interface improvements simplify working on the Web. Pausing the mouse over large, tracking buttons on the toolbar displays a short description. A status bar at the bottom of the browser windows displays descriptions of links, downloading information, and URLs. Plus, you can customize and easily change your preferences for using the browser.

For beginners as well as more experienced users, Microsoft Internet Explorer 3.0 provides links to resources for learning how to use the Internet and for learning more about Microsoft Internet Explorer 3.0 product information and support. Plus, it includes links to Internet search engines that that help you find your way around the Web.

Internet Tutorial

You can learn more about using the Internet through a tutorial for beginners on www.msn.com. The tutorial, "New to the Internet," covers the basics of Internet navigating and searching.

Internet Explorer Home Page

You can learn more about Microsoft Internet Explorer 3.0 on www.microsoft.com/ie/. On this page you can get answers to the most frequently asked questions about Internet Explorer, learn about its cool features, link to other pages that showcase its features, or download tools that help you design and create exciting content on your own Web page.

Easy to Explore

The familiar look and behavior of Microsoft Internet Explorer 3.0's user interface enables you explore the Web with ease.

Hot Tracking Button

Larger, friendlier buttons that change color when the mouse hovers over them increase the ease with which people can navigate. Plus, text descriptions under the buttons can sized according to your Windows appearance.

Animated Toolbar

Internet Explorer 3.0 communicates downloading information more effectively than before by animating the toolbar's background while dowloading is in progress. Developers can customize the animation by replacing the default with their background image.

Download Information Dialog Box

Provides information about the size of the file and an ongoing estimate about the time remaining before the download is complete.
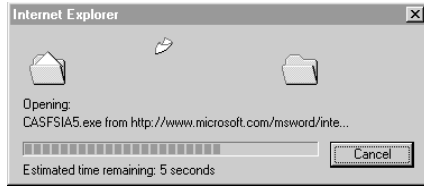
Figure 18 Keep track of the status of file as it is downloading.

Enhanced Internet Printing

Microsoft Internet Explorer provides enhanced Internet printing capabilities, including:

- **Print Table of Links.** When you print a Web page from within Internet Explorer 3.0, you can also choose to print a table of links that specifies URLs. Instead of just seeing underlined links on your printed page, a table appears at the end of the document telling you the address of each link.

-
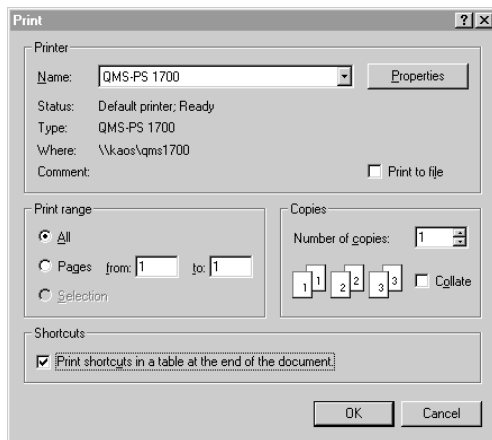
- **Figure 19** Print a table that tells you where all the links on a Web page go.

> Try This:
>
> 1. Find a Web page you want to print.
>
> 2. On the File menu, click Print, and then select the option Print Shortcuts In A Table At The End Of The Document.

The following printing enhancements will be available in later releases of Internet Explorer:

- **Print Preview**. A screen representation of how the page will be printed, a feature similar to wordprocessing applications, such as Microsoft Word.
- **Drag and Drop Printing**. Drag a URL onto your printer Icon, and it will launch IE and print the page.
- **Selective Printing**. Print only the portion of a Web page that the user has highlighted.
- **Recursive Printing**. Print the current Web page, plus print all of the Web pages that this page links to, plus all of the pages that they link to, etc. The user may specify a variety of limits, such as

> maximum levels of recursion, maximum pages printed, pages at this site only, etc.
> - **Background Printing.** When the user elects to print the current page, the page is copied and printed in a separate thread, leaving the user free to move to another page in the browsing window.

In addition, we are working on a number of enhancements to image printing, including better resolution, images spanning pages, and background image options.

Improved Frames Navigation
Microsoft Internet Explorer 3.0 reduces the confusion about navigating and printing frames. Now, when you click the Back button, you can retrace the frames you visit instead of simply jumping back to the last Web page (URL) you visited.

Smooth Scrolling
Lets you keep track of content while scrolling through a page packed with information. Pressing the PAGE UP or PAGE DOWN keys , or using the scrolling arrows, makes the page scroll like a video without any jerky movements.

Try This:
While viewing a Web page, press the PAGE DOWN or PAGE UP key to see how the page scrolls.

Search Button
A search button on the Internet Explorer toolbar (the globe with the magnifying glass) provides instant access to powerful Internet search engines like Yahoo, Lycos, and Infoseek. These search engines are accessible at any time just by clicking the Open Search Page button. Plus, you can change your default search page whenever you want by clicking the View menu, clicking Options, , and then clicking the Start And Search Pages tab and following the instructions on the screen.

Simplified URLs
Microsoft Internet Explorer 3.0 intelligently determines the protocol of a particular site. Plus, you can type simplified site addresses. For example, you don't have to type "http" before a Web or intranet site address.

 Try This:
1. Instead of opening "The Internet " from your desktop and then opening a particular site, just click the Start button, and then click Run.
2. Then type the name of the site (for example, www.microsoft.com). This even works from the command line (at the C:\ prompt, type **start www.microsoft.com**).

Shortcut Menus
Internet Explorer follows Windows 95 conventions of providing context menus for both graphics and Web page information displayed on Internet sites. These are access by right-clicking the item. Shortcut menus provide quick access to those commands which apply to the selected item.

```
Open
Open In New Window
Save Target As...

Save Picture As...
Set As Wallpaper

Copy
Copy Shortcut

Add To Favorites...
Properties
Properties
```
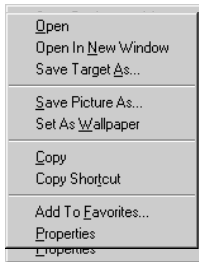
Figure 20 Shortcut menu for graphic on Web page with link

Internet Shortcuts

Internet Explorer extends shortcuts to include global Internet sites. Instead of pointing to a file on the LAN or on a PC, an Internet shortcut can now point to a URL (Uniform Resource Locator) on the Internet. An Internet shortcut can be embedded in a document, mailed to a friend or colleague, or stored in a folder on your computer.

Microsoft Internet Explorer 3.0 is "drag-and-drop enabled" for creating shortcuts and much more. You can easily capture a graphic from a Web page by just dragging it to your desktop. Or you can drag a graphic or a shortcut back into the Internet Explorer window to display it.

Accessibility

Microsoft Internet Explorer 3.0 provides greater Internet accessibility for all people by being the first browser to provide any significant accessibility features. It enables keyboard navigation of the Web, and provides the option to increase font size on any Web page, and other accessibility features.

Keyboard Navigation

With Microsoft Internet Explorer 3.0, you can explore the Web from the keyboard by pressing TAB and SHIFT+TAB to navigate back and forth between image and text links, hotspots in client-side image maps, and more.

As you move to or click a hyperlink or image, a one-pixel border is drawn around it so you can see what is selected. This works for client-side image maps, too−even for hotspots that are circles or polygons!

Other keyboard shortcuts include the following.

ENTER to go to a link	ALT+LEFT ARROW and ALT+RIGHT ARROW to go back and forward	BACKSPACE and SHIFT+BACKSPACE to go back and forward
SHIFT+F10 to display a context menu for a link	CTRL+R to refresh the current page	ESC to stop downloading the page
CTRL+O to go to a new location	CTRL+N to generate a new window	CTRL+S to save the current page
CTRL+TAB to cycle between frames	SHIFT+TAB and SHIFT+CTRL+TAB to go backwards through links and frames	F5 to refresh the page

Large Font Option

With Font button on the toolbar, you have complete control over the size in which fonts are displayed.

Other Accessibility Features

Provides features that let text-only browsers read your page, including tooltips for pictures that tell you the location (URL) of a link and support for the ALT tag that enables you display alternate text for images.

Fast Exploring

People browsing the Web today are easily frustrated by the amount of time it takes to download graphics or software, view all the material on a site, and connect to different sites. Microsoft Internet Explorer 3.0 works with the currently available bandwidth by supporting several simple mechanisms to quicken the pace of browsing.

ISDN Support

Internet Explorer 3.0 enables you to connect to the Internet through an ISDN line, a high-speed digital telephone line that enables you to transmit information on the Internet at much greater speeds.

Smaller Memory Requirements

The code for Internet Explorer 3.0 is small and efficient, increasing its performance and requiring less memory than its competitors' browsers.

Quick Links

Internet Explorer 3.0 comes pre-loaded with useful and cool sites on the Web, helping people quickly get up and running on the Internet.

Fastest Scripting

Internet Explorer 3.0 provides the fasted scripting support for any programming language of all Internet browsers on the market.

Smart Caching

Internet Explorer enables you to cache pages and graphics between Internet sessions, letting you work with Web content offline (for example, from the seat of an aircraft). Caching pages also enables you to connect more quickly to frequently used pages. Plus, improvements to Internet Explorer 3.0's caching mechanism let you set when you want Internet Explorer to refresh the page. Internet Explorer 2.0 refreshed the page every time you visited a site even if the content hadn't changed.

The HTTP Last-Modified-Since and Expires attributes are used to determine when a cache page is stale. Internet Explorer takes a relatively conservative approach to cache management, checking the Last-Modified-Since and Expires attributes of every object on a Web page. Other browsers only validate the page itself, and not the content, leaving them vulnerable to stale caching errors.

> Try This:
> To check on your cache and history settings, click the View menu, click Options, and then click the Advanced tab.

32-bit Multithreading

Internet Explorer 3.0 is a complete 32-bit application, building on Windows services such as the Telephony API (TAPI), and on the native 32-bit TCP/IP stack. Internet Explorer uses multiple threads of execution to deliver excellent responsiveness. This means that Internet Explorer 3.0 is more robust than 16-bit browsers and provides smooth multitasking performance, which is an advantage during lengthy downloads.

Progressive Rendering

Progressive rendering delivers complex graphics quickly, enabling users to view low-resolution version of graphics during download, eliminating the need to wait for the entire transfer before viewing the image. Progressive rendering support is included for both GIF and JPEG format images.

Fast Text Mode

Instead of waiting for large graphics to download before displaying text and hyperlinks, Internet Explorer 3.0 loads the text first and inserts placeholders for slow loading images while they are downloading. This enables you to view the most important information and links much faster than conventional browsers.

Summary of Microsoft Internet Explorer 3.0

Internet Explorer 3.0 is the best browser for developers, Webmasters, and end-users to experience and invent the latest active content on the Web. Developers and Webmasters can

exploit ActiveX technology to leverage a limitless range of reusable components and services which can talk to one another−independent of programming language or host container. The ActiveX architecture and the advanced multimedia architecture on which Internet Explorer is built enables creation of content that transforms an often dull, static Internet experience for end-users into an interactive and engaging experience.

Plus, Microsoft Explorer 3.0 enriches everyone's experience of the Internet by enabling you to:

- Personalize your experience through customizable browser features, home pages, and site ratings.
- Explore the Internet with assurance, knowing with built-in security you can communicate privately, download code you can trust, and identify yourself to others across the Internet.
- Communicate all over the world with fully integrated email, newsreading, multilanguage, and conferencing capabilities.
- View and create all the coolest and most current content on the Web because of its underlying technologies and support for the latest HTML, multimedia communications, and security standards.
- Create exciting, interactive content for Web pages and applications with any programming language or tool.

Many of the Microsoft Internet Explorer 3.0's innovations are the result of Microsoft identifying the needs of developers, Webmasters, and end users for a more compelling, easier, and secure Internet experience. Microsoft will continue to enhance everyone's overall Web experience by collaborating with key industry partners and leading the effort to define Internet standards. Paying close attention to customers' needs and designing features and architectures to implement them ensures Microsoft Internet Explorer will remain a step ahead of all other browsers.

Appendix A

Product Comparison Guide for Microsoft® Internet Explorer 3.0 (Beta)for Windows 95 and Windows NT 4.0 and Netscape Navigator 3.0

This appendix provides information to assist in the comparison of the Microsoft Internet Explorer 3.0 beta and Netscape Navigator 3.0 beta. This document does not discuss all of the functionality planned for incorporation into the Microsoft Internet Explorer 3.0, but represents the functionality contained in the beta release. In order to test the functionality of the Internet Explorer you can download it free-of-charge from the Internet at http://www.microsoft.com/ie.

Active Web Content

Scripting and Web Application Development: *Using ActiveX to create the webs most interactive pages*		
Native ActiveX Control support	Yes	No[†]
Native ActiveX Documents	Yes	No[†]
Java Applets	Yes[‡]	Yes
VBScript	Yes	No
Can read and execute JavaScript pages	Yes	Yes
Scripting of Java Applets	JavaScript and VBScript	JavaScript only
Browser serves as reusable control for Integration into external applications	Yes	No
Netscape-compatible Plug-ins	Yes[‡]	Yes

[†] Requires the NCompass Netscape-compatible Plug-in for ActiveX Controls
[‡] Not implemented in Beta 1. Should be included in a later beta release
[‡] Not implemented in Beta 1. Should be included in a later beta release

Multimedia - *Using ActiveX Controls to make your Web pages come alive!*		
Video formats (ActiveMovie™/LiveVideo)	MPEG, AVI, MOV, QuickTime, Indeo§	AVI
Audio formats	WAV, MIDI, AIFF, AU, TrueSpeech, MPEG audio§	AIFF, AU, MIDI, WAV
In-line (streamed) sound support	RealAudio and other ActiveX Controls	RealAudio Plug-in
In-line (streamed) video support	Yes‡	No
QuickTime video playback	Yes (ActiveMovie™*)	Apple QuickTime† plug-in
MPEG video/audio playback	Yes (ActiveMovie)	No
3D Animation and VRML	Direct3D*	Live3D
HTML Support - *Employing standards to create great looking Web pages*		
HTML 3.2 tags	Yes	Most
Tables with Background Images	Yes	No
Tables with Background Colors	Yes	Yes
Tables with wrapped text	Yes	No
Tables with cell grouping	Yes	No
Stylesheets	Yes	No
Typeface selection	Yes	No
Scrolling Marquees	Yes	No
Standard Frames	Yes	Yes
Enhanced Frames (borderless, frames-within-frames, and non-scrolling frames)	Yes	No
Support of TrueType font download	Yes	No
Background images	Yes	Yes
Watermarks (non-scrolling backgrounds)	Yes	Yes
Font Colors	Yes	Yes
Transparencies	Yes	Yes
Sub/Super Script	Yes	Yes
Background sound	Yes	Yes
Blinking Text	No	Yes
HTML 2.0 tags	Yes	Yes

---

§ The control is extensible to support future formats and playback standards

* ActiveX Movie™ supports MPV, MPA, MPE, MPEG, AU, AIF, AIFF, SND, MID, RMI, Wav + AVI, MOV, and QuickTime formats in a single control and is extensible for support of future technologies

* VRML functionality is incomplete in Beta 1, will be completed in a later release

Secure

Code Signing for Java Applets	Yes	No
Control scripting security	Yes	No
Control security for data streaming	Yes	No
Site Certificate Support	Yes	Yes
Client-side Certificates	Yes‡	Yes
SSL 2.0/3.0 support	Yes	Yes
PCT Support	Yes	No
Support for the Win32 CryptoAPI# 1.0	Yes	No

Communication and Collaboration

Internet Conferencing Features - *Communicating with others - over the Internet*		
Internet Audio Communication	Point-to-Point	Point-to-Point
Collaborative Whiteboard	Multipoint	Point-to-Point
Internet Chat	Multipoint	Point-to-Point
Share stand-alone applications (work simultaneously on a document)	Multipoint	No
File Transfer	Yes	No
Shared Clipboard	Yes	No
Standards-based conferencing (T.120, G.723, H.323)	Yes	No
Internet Answering Machine	No	Yes
NNTP Internet Newsreader	Yes	Yes
Newsgroup Posting	Yes	Yes
POP3 Internet Mail client	Yes	Yes
Mail Send command allows you to mail an Internet shortcut from the browser	Yes	Yes
Multilingual support◊		
Default language characterset option	Yes	No

---

‡ Not implemented in Beta 1. Should be included in a later beta release
# See the Internet Explorer 3.0 for Windows 95 and Windows NT 4.0 Reviewers Guide for details on the CryptoAPI.

Easy and Personalized Exploring

Personalization Features - *Creating the personal Web experience*		
Ratings (PICS) Support	Yes	No
History and Favorites (Bookmarks) menus	Yes	Yes
User-defined hierarchical Favorites	Yes	No
Customizable, personal home page	Yes	Yes
Distribution/Administration Kit	Yes	Yes
Ease-of-Use Features *Making the Internet accessible to everyone*		
Search, e-mail, news, edit buttons on toolbar	Yes‡	No
View frame's HTML source on context menu	Yes	No
Links table printing option (for printing link sources at the end of the HTML document)	Yes	No
View Source and Refresh context (pop-up) menu commands for pages in frames	Yes	No
Refresh and View Source context (pop-up) for page items	Yes	Yes
Internet shortcuts	Yes	Yes
Quick access to QuickLink locations	Yes	Yes
On-line tutorial	Yes	Yes
Mail Send command allows you to mail an Internet shortcut from the browser	Yes	Yes
GUI, Toolbars, help	Yes	Yes
Drag-and-drop of Web page links	Yes	Yes
Full keyboard accessibility	Yes	Yes
Print Preview	No	Yes
Performance Features - *Providing a high-performance Internet client*		
Fast Connect (HTTP KeepAlive)	Yes‡	Yes
Text tags and window sizes are displayed while the graphic is being downloaded	Yes	Yes
HTML extensions for custom font typefaces and sizes (reduces page size)	Yes	No
Integrated support for ISDN	Yes	No
Multi-threaded execution	Yes	Yes
Multiple server connections during download	Yes	Yes
Fast text mode for fast display of text	Yes	Yes
Progressive rendering of GIF and JPEG images	Yes	Yes
Smart caching using HTTP Last-Modified-Since and Expires attributes per-page item	Yes‡	Yes

---

‡ Not implemented in Beta 1. Should be included in a later beta release
‡ Not implemented in Beta 1. Should be included in a later beta release

Audio and Video Streaming	Yes	Yes
Client-side Image maps	Yes	Yes

Pricing & Support

Price	Free	$49.00[†]
Full Support	Yes	Yes

The Internet, a Global Community

Overview		
Number of localized language versions	27	6
View any characterset on any version of Windows	Yes	No
International Language control settings	Yes‡	Yes
Languages in which the browser is available◊		
Brazilian Portuguese	Yes	No
Czech	Yes	No
Danish	Yes	No
Dutch	Yes	No
English (US and International)	Yes	Yes
Finnish	Yes	No
French	Yes	Yes
German	Yes	Yes
Greek	Yes	No
Hungarian	Yes	No
Italian	Yes	No
Japanese	Yes	Yes
Korean	Yes	No
Norwegian	Yes	No
Polish	Yes	No
Portuguese	Yes	No
Russian	Yes	No
Simplified Chinese	Yes	No
Slovenian	Yes	No
Spanish	Yes	No

[†] Based on pricing for Netscape Navigator 2.0, version 3.0 is an unreleased product.

‡ Not implemented in Beta 1. Should be included in a later beta release

◊ Not all languages will be available in the beta cycles.

	Yes	No
Swedish	Yes	No
Traditional Chinese	Yes	No
Turkish	Yes	No