

DRAFT

# Microsoft® Internet Explorer 4.0 for Windows 95 and Windows NT 4.0

## Competitive Guide

*The Best of the Web, the Best of the PC*

*March 1997*



## Microsoft Internet Explorer 4.0 vs. Netscape Communicator Competitive Guide

This document provides an informative framework for organizations and individuals to compare Internet Explorer 4.0 and Netscape® Communicator for Windows 95/NT.

Other product and company names herein may be the trademarks of their respective owners. All of the content in this document is subject to change. Netscape data is based on information found on Netscape's web site (www.netscape.com) as of 2/20/97, or inferred from Netscape Communicator Preview Release 1.

Those features which are not currently implemented in this Preview Release, but which will probably be implemented in the next IE 4.0 release, are called out with a (next release) or the symbol □.

### Executive Summary

Microsoft Internet Explorer 4.0 is a suite of products which comprise Microsoft's overall concept known as the Web PC – the fundamental notion that browsing the Web is an integral part of everyday computing tasks, and therefore should be a natural part of the PC experience. This evolutionary product integrates the browser into the operating system, creating a single way to find, work, and play with all the information you want, whether it's on your personal computer, a shared local network, or the World Wide Web.

Internet Explorer 4.0 brings incredible advances to browsing technology and allows for scalable communication and collaboration. These advances make it easier to communicate with others, make it easier to find relevant and personalized information, make it easier for content developers to create compelling content, and make the whole Web experience more entertaining and productive.

Internet Explorer 4.0 offers a comprehensive suite of Internet applications, whose benefits include:

- ◆ **The Best Browser** for end users and organizations, and a solid development platform for content developers.
- ◆ **Complete Communication and Collaboration**, offered with HTML-rich, Internet standards-based audio/video/data conferencing, messaging, and discussion groups.
- ◆ **Personalized Information Delivery**, which provides a rich way to send and receive information, whether through Web pages, email messages, or software components.
- ◆ **True Web Integration** means Internet access becomes a seamless part of your operating system, and therefore your PC.
- ◆ **Complete Administrative Features** for business, so corporations have the best client for improved corporate communication, easy deployment and administration, and reduced total cost of ownership.

By comparison, Netscape's Communicator and Constellation products are positioned as "the complete set of tools users need every day to easily and effectively communicate, share, and access information on intranets or the Internet." Constellation, Netscape's additional shell that would lie on top of the underlying native OS, is described as a "workspace that lets you customize, focus, and automatically receive the information you care about."

There are striking differences between Microsoft's and Netscape's visions for the future of computing.

First of all, Netscape has determined that there is only one market segment – business users. Communicator is being marketed to meet their needs. Unfortunately, they not only left out the entire home and small business markets, but they also only partially solved the business user needs! For the portion of the market that need true collaboration solutions, they should compare Communicator's offerings to Microsoft's Outlook & Exchange or IBM's Lotus Notes. On that playing field, users will find that Communicator just doesn't offer the features they need. Microsoft, on the other hand, has designed a

DRAFT

scalable set of communication and collaboration clients, which allow the user to select which is most appropriate for them. For the home or small business owner, IE 4.0 offers a much better solution than Communicator, while providing the opportunity to scale up to a more powerful solution when required.

Netscape defines integration as a suite of applications that reside in one gigantic program that lives on top of the native operating system. Microsoft believes that true integration requires these internet-enabled clients to integrate with the native OS. Microsoft also believes in giving the user more choice, not less. Netscape has chosen to provide a one-size-fits-all set of communication applications, which all Communicator users are forced to use, regardless of their needs.

With Constellation, Netscape would have users believe that they can create a better environment for users on the Windows, Macintosh and Unix platforms. And yet, judging by their plan for the Windows 95/NT platform, Netscape is only going halfway towards integrating the user's Web and PC experience. Microsoft's IE 4.0 takes the full step forward for Windows 95/NT users, by creating an environment that enables a single way to find, work, and play with all the information users want, whether it's on their personal computer, a shared local network, or the Web. Microsoft is committed to bringing IE 4.0's advances in the browser, content delivery, and communications to the Macintosh and Unix platforms, but will take a cautious approach to the level of OS integration on these platforms.

Netscape has made a big deal about supporting users who roam from platform to platform. Microsoft believes that the more important issue is to provide powerful and easy to use central administration for corporate MIS, in order to effectively control costs while improving overall productivity.

Netscape often highlights how they offer the open, standards-based solution. The truth is that Microsoft has been faster to support and implement Internet standards, and been more proactive about working with the W3C and other standards bodies to create truly useful and more effective standards than has Netscape.

And finally, IE 4.0 supports a business model that allows content developers and corporations to leverage their abilities in a way that truly adds to their business objectives, with a wealth of development tools for developing effective, powerful implementations of channels and web sites that leverage IE 4.0.

This comparison guide is intended to provide in-depth exploration of the issues mentioned here and listed in the following top-level comparison tables. The first compares general features and benefits.

<b>General Benefits Comparison Summary</b>	<b>Internet Explorer 4.0 "The Web PC"</b>	<b>Netscape Communicator</b>
<b>Browser</b>	<ul style="list-style-type: none"> <li>• Easier &amp; Faster than IE 3.0</li> <li>• Latest technology</li> <li>• Polished end-user app</li> </ul>	<ul style="list-style-type: none"> <li>• Still catching up to IE 3.0</li> <li>• Unrefined</li> <li>• Missing key standards</li> </ul>
<b>Communication &amp; Collaboration</b>	<ul style="list-style-type: none"> <li>• Scaleable</li> <li>• Standards-based</li> <li>• Integrated &amp; offline support</li> </ul>	<ul style="list-style-type: none"> <li>• One-size-fits-all</li> <li>• Targeted at corps, yet missing key corp features</li> </ul>
<b>Personalized Information Delivery</b>	<ul style="list-style-type: none"> <li>• Open delivery protocols</li> <li>• Multiple delivery &amp; notification options</li> <li>• Open to any content provider</li> <li>• Premium Content</li> <li>• Integrated offline features</li> </ul>	<ul style="list-style-type: none"> <li>• Delivery protocol restrictions</li> <li>• Fewer user options</li> <li>• Lacks Premium content</li> </ul>
<b>Web Integration</b>	<ul style="list-style-type: none"> <li>• Same UI already know</li> <li>• Seamless – one UI for PC and Web</li> </ul>	<ul style="list-style-type: none"> <li>• New UI, requires retraining</li> <li>• Separate application on top of the native OS</li> </ul>

<b>General Benefits</b>	<b>Internet Explorer 4.0</b>	<b>Netscape Communicator</b>
<b>Comparison Summary</b>		
	<b>“The Web PC”</b>	
<b>Centralized Administration</b>	<ul style="list-style-type: none"> <li>• Easy set-up and central administration</li> </ul>	<ul style="list-style-type: none"> <li>• Too much focus on roaming users, not enough on management tools</li> </ul>
<b>Business Model</b>	<ul style="list-style-type: none"> <li>• Complete developer support</li> <li>• Open protocols, more options</li> <li>• Cost-effective solution</li> </ul>	<ul style="list-style-type: none"> <li>• Raw tools only</li> <li>• Protocol restrictions</li> <li>• Costly to distribute</li> </ul>

And, on a client-by-client basis, this second table shows how Microsoft wins or ties in virtually every category. Microsoft believes Netscape’s Collabra and Calendar products are not as functional as their relevant competitors (Microsoft Outlook/Exchange and Lotus Notes), with the result that users who need powerful collaboration and group scheduling will gravitate to more capable products, while end-users who don’t need these capabilities will be better served by the scaleable solution found in Internet Explorer.

<b>Specific Client</b>	<b>Internet Explorer 4.0</b>	<b>Netscape Communicator</b>
<b>Comparison Summary</b>		
	<b>“The Web PC”</b>	
Suite Integration across clients	Win	Lose
Web Browser & Technologies	Win	Lose
Messaging	Win	Lose
Discussions/Groupware <sup>1</sup>	Tie	Tie
Conferencing	Win	Lose
Calendar/PIM <sup>2</sup>	N/A	Win
HTML Authoring	Tie	Tie
Personal Web Server	Win	N/A
Content Delivery	Win	Lose
Administration	Win	Lose

## ***The Best Browser***

The most important aspect of having a great Web experience comes from the strength of the browser. Internet Explorer 4.0 provides the easiest, fastest, and most fun way to browse the Web. It does so through performance improvements, drag-and-drop customization, easy navigation of URLs, and enhanced searching, to name just a few of the features described below. Making browsing more fun also involves continuing to lead the way in supporting Internet protocols and standards that result in more

<sup>1</sup> Outlook Express News offers better NNTP-based newsgroup functionality than Collabra. For the small portion of the market which require high-end collaboration, Microsoft’s Outlook/Exchange Server solution is a better solution than Netscape’s proprietary-protocol-based Collabra.

<sup>2</sup> Outlook offers Windows 95/NT users a far better solution for those users who really need a corporate-level calendaring/PIM product.

exciting and rewarding content for end uses to access. Thus Internet Explorer 4.0 supports more Internet standards than any other product including HTML, Java, ActiveX, and both JavaScript and VB Scripting.

Internet Explorer 4.0 is the best browser available because of its:

- Ease of Use Innovations and Personalization Improvements
- Best Implementation of Internet Standards
- Performance Enhancements
- Security Features

## **Ease of Use Innovation & Personalization Enhancements**

Users can be frustrated trying to find what they want on the Internet and returning to sites they've enjoyed. IE 4.0 introduces major improvements that make searching the Web and managing the results of those searches easier and more rewarding. IE 4.0 has taken a huge step forward in regard to navigation. This includes easier access to search engines and making it fast and easy to get to commonly visited sites. By removing the frustration in exploring the Web, users spend less time remembering where something is located, and more time working.

While you've already read about browsing information offline, IE 4.0 also automatically looks at the sites you find most interesting or useful, and lets you know when there's new information available. Instead of getting random information from content providers asking you to look at their site, IE 4.0 looks at your Favorite sites, and informs you of changes before you even get to the site, so you can decide whether it's worth checking it out without any browsing.

Internet Explorer 4.0 will once again lead the competition with the strongest international language support. The Preview will be released in a total of nine languages, including English, French, German, Greek, Italian, Japanese, Polish, Portuguese Brazilian, and Spanish.

IE 4.0 introduces the following key features for making browsing easy and personalized:

- **Full Screen Viewing.** Users can view web pages full-screen with autohide toolbars & scrollbars.
- **Suite Integration.** Easily access all of IE 4.0's clients from each other, or from the suite taskbar.
- **Search Pane.** Keeps a list of search results in view while the user explores the sites listed.
- **History Pane.** The HistoryPane provides a listing of the pages you've been to before, integrated into the browser.
- **User Feedback.** With IE 4.0's improved user feedback, users always know what the browser is currently doing.
- **AutoComplete.** The Address Bar in IE 4.0 automatically completes addresses for users.
- **Smart Favorites.** Users can set their favorite sites as "Smart Favorites" that are automatically downloaded to their desktop for viewing offline. You can even get thumbnail views of web pages.
- **Navigation History on Back and Forward Buttons.** Users can view a list of the sites they've visited most recently via a new feature added to the Back and Forward buttons.
- **Improved Printing.** IE 4.0 has substantially richer printing functionality.

Browser Features	Internet Explorer 4.0 "The Web PC"	Netscape Navigator
<b>Ease-of-Use &amp; Personalization</b>		
<b>Ease-of-Use Features</b> <i>Making the Internet easy for everyone</i>		
Suite Integration w/easy suite member switching	Yes	Partial
Smart Favorites which check web site for updates and download for offline viewing	Yes	No

<b>Browser Features</b>	<b>Internet Explorer 4.0 “The Web PC”</b>	<b>Netscape Navigator</b>
<b>Ease-of-Use &amp; Personalization</b>		
Thumbnail view of Favorite sites	Yes	No
Integrated Search Pane	Yes	No
Integrated History Pane	Yes☐	No
AutoComplete Address Bar	Yes	No
Enhanced Navigation history available on Back/Next buttons	Yes	Yes
User-friendly Error, alert & status messages and sound events	Yes☐	No
Full-screen browser & Kiosk mode	Yes	Yes
Offline browsing	Yes	Unknown
<b>Personalization &amp; Fun Features – <i>Enjoying your personal Web experience</i></b>		
Rearrange and Combine Toolbars	Yes	No
International Language Support	9 (Preview) 25-30 (final)	11 languages planned (final)
Distribution/Administration Kit	Yes	Yes
Use Mail/News client of choice	Yes	No

## **Best Implementation of Internet Standards**

The key to advancing the Web experience is to provide the best implementation of standards. Now, people can view and listen to real-time netcasts, watch videos, run ActiveX controls and Java applets, and play interactive, multiplayer games while they’re surfing the Web. All this content can be experienced in Internet Explorer 4.0 because of its extensive support for Internet standards, and because it includes innovative, underlying technologies, such as Dynamic HTML, ActiveX, and Java. Internet Explorer 4.0 offers a new way for authors to control every element in a Web page with Dynamic HTML. Using this set of technologies, you can produce more enticing content and develop consumer and business applications that deliver more value, creating a unique, fun, and more rewarding experience for end users.

## **Dynamic HTML, HTML 3.2, and Compatibility**

### ***Dynamic HTML***

Limitations of current browser technology often require HTML authors to choose between page interactivity and speed. To address that limitation, Internet Explorer 4.0 includes several new features collectively called Dynamic HTML. These features provide the client-side intelligence and flexibility to enable HTML authors to create interactive pages that dynamically change the display and/or content of a page entirely on the client machine, without requiring the entire page to be reloaded or another page to be retrieved from the server. Therefore, Dynamic HTML enables HTML authors to create innovative Websites with interactive pages without having to pay a performance penalty, regardless of whether these pages are for business or consumer applications. As an additional benefit, by reducing requests from the server, Dynamic HTML also reduces server load, thus improving its performance.

Microsoft is committed to working with the W3C to make the Web a better open environment for building efficient and interactive multimedia content. Dynamic HTML represents the next step in that commitment. Consistent with Microsoft's commitment to open standards, all the HTML and CSS extensions for Dynamic HTML have been submitted to the W3C. Microsoft has been working closely with the W3C and will enhance future versions of IE to conform to specifications recommended by the W3C. Unlike Netscape's proposed solution (JavaScript Style Sheets), dynamic styles can be used after a page has been loaded, even if it requires changes to the layout of the text in the page. As it is, Netscape's

LAYER syntax has already been dropped by the W3C and will not be considered any further as a standard.

Using Dynamic HTML, Web developers can produce enticing content for consumer and business applications that deliver more value while creating a unique and rewarding experience for end users. Dynamic HTML features include:

- ◆ **Dynamic Styles:** Dynamically change the style of every HTML element in a document.
- ◆ **Positioning:** Place and interactively move elements - images, controls or text - anywhere on the page, including above or below other elements.
- ◆ **Dynamic Content:** Dynamically change the content of an HTML page by inserting or deleting elements in a page, as well as by modifying the text of individual elements.
- ◆ **Multimedia and animation:** Create dynamic visual effects such as filters, animation, and transitions, on page elements, entire pages, or between pages without scripting.
- ◆ **Data Binding & Awareness: Integrate data with native HTML elements.**

Browser Features	Internet Explorer 4.0 "The Web PC"	Netscape Navigator
<b>Dynamic HTML</b>		
Dynamic Styles	Yes	Yes (On document load only; proprietary)
CSS compliant Absolute Positioning	Yes	Non-standard
Layers	Yes	Non-standard
Dynamic Content	Yes	No
Multimedia & Animation	Yes	Yes
Data Binding & Awareness	Yes	No
JavaScript Style Sheets (JSSS)	No	Yes

### **HTML 3.2 and Compatibility**

Internet Explorer 4.0 continues to lead Netscape Navigator with the broadest HTML 3.2 support, including the broadest CSS1 support, new rich forms and others. Even with Communicator, Netscape still lags behind IE 3.0 in HTML support. Netscape has developed their own proprietary extensions for layering, JSSS, and tables – in essence increasing switching costs for customers by developing these proprietary solutions. This may cause considerable future migration problems and most certainly will cause backwards compatibility problems. Their table extensions contradict the standard that has been supported since HTML 3.2, and their layer tag has already been dropped for consideration by the W3C.

Browser Features	Internet Explorer 4.0 "The Web PC"	Netscape Navigator
<b>HTML 3.2 &amp; Compatibility</b>		
<b>HTML Support</b> - <i>Employing standards to create great looking Web pages</i>		
HTML 3.2 tags	Yes	Some
W3C HTML OBJECT tag	Yes	Yes
Enhanced Frames (borderless, inline, and floating)	Yes	borderless only
<b>Compatibility</b>		
Cascading Style Sheets (CSS1)	Yes (core + advanced <sup>3</sup> )	Partial (core only) <sup>3</sup>
PICS ratings	Yes	No

<sup>3</sup> Implementation involves JSSS, which means it is likely to create scripting errors for incorrectly implemented CSS1 tags, which is not very user-friendly.

Browser Features	Internet Explorer 4.0 "The Web PC"	Netscape Navigator
<b>HTML 3.2 &amp; Compatibility</b>		
File upload	Yes☐	Yes
Server push	Yes	Yes
Automatic Proxy Configuration	Yes	Yes
HTTP 1.1 support	Partial ☐ (performance enhancements)	Unknown
Downloadable Web fonts (True Type Std)	Yes	No (non-std Bitstream TrueDoc)
Unicode International character support	Yes	Yes
Rich Forms	Yes	Unknown

## Bringing Interactivity to the Web

While important for viewing static web pages, HTML provides only some of the web's potential for dynamic web pages and Internet interactivity. More powerful web content demands applications such as ActiveX controls or Netscape Plug-ins to extend beyond HTML. Scripting these software applets together provides for interactivity and a dynamic Internet experience.

Internet Explorer 4.0 and Navigator 4.0 both support Java applets, JavaScript, and Plug-ins. But customers have requested a browser that supports cutting-edge Web technology and also leverages existing information and code. Internet Explorer 4.0 satisfies these demands using ActiveX, which Netscape has yet to support. ActiveX is the only cross-platform, language and application independent set of technologies.

### *ActiveX*

ActiveX support in IE 4.0 allows ActiveX controls to be faster, smaller, and more fun than ever before. In addition, IE 4.0's ActiveX Control Viewer makes it easy for users to manage their controls.

Developers can write ActiveX controls in any language, including C++, Visual Basic, and Java. IE 4.0 comes installed with a set of new ActiveX multimedia controls that make it easy for developers to deliver dazzling yet low-bandwidth effects on their Web pages. Also, ActiveX controls have full access to IE 4.0's object model, which lets developers manipulate pages dynamically. To make it even easier for developers to work with ActiveX scripting, Microsoft has developed the ActiveX debugger. With this tool, which can be downloaded for free from our web site, you can easily view and edit your ActiveX scripts. With the ActiveX Control Viewer, it's much easier for users to see the controls installed on their PC, and delete any of them if they haven't used one in a long time, maximizing their available disk space.

Netscape has announced that they will offer some support for ActiveX. Without this support, users can not leverage their existing investment in Office documents and other languages, and must recreate these using HTML or Java. While it is unclear how complete their support will be, it is unlikely to be as comprehensive as Microsoft's. Support for Active X is not in the first Preview Release of Communicator.

Browser Features	Internet Explorer 4.0 "The Web PC"	Netscape Navigator
<b>Interactivity</b>		
<b>ActiveX: Using ActiveX to create the webs most interactive pages</b>		
ActiveX support	Full	Partial
ActiveX Control Viewer	Yes	No
Java Bean Support	Yes	No
ActiveX Script Debugger	Yes☐	No



<b>Browser Features</b>	<b>Internet Explorer 4.0 “The Web PC”</b>	<b>Netscape Navigator</b>
<b>Interactivity</b>		
Auto-Install and signing of plug-ins	Yes	Yes
<b>Component Object Model:</b>		
Browser serves as reusable control for Integration into external applications	Yes	No
ActiveX	Yes	Partial
DCOM	Yes	No
CORBA/IIOP Support	No	Yes
Installable JIT architecture	Yes	No

### *Java*

Microsoft is committed to providing the fastest, most robust, best-of-the-breed Java development tools and Java run-time implementation available. Java brought dynamic, interactive content to the Web. With IE 4.0, Java applications become even more powerful. IE 4.0 makes it easier for developers to create more full-featured Java applications for the Web. Performance has been improved, too, making Java applications run even faster than the fastest implementation in Internet Explorer 3.0. There are also enhancements to security, ensuring that interacting with these powerful applications is safe.

With Microsoft’s AuthenticCode, signed Java applets and libraries are allowed out of the Java sandbox and have complete access to the system if the source is trusted by the user. Now both Microsoft and Netscape are implementing a Java applets capabilities-based security model. This allows the user to give applets an increasing level of access, such as limited disk access; limited disk and network access; limited disk read access and unlimited disk write access; and unrestricted access. In Netscape’s implementation, a dialog box will pop up for the user and the user has to either permit such access or deny it (i.e. back to sandbox). IE 4.0 will offer a much easier user interface.

<b>Browser Features</b>	<b>Internet Explorer 4.0 “The Web PC”</b>	<b>Netscape Navigator</b>
<b>Java</b>		
Object tag support	Yes	Yes
Auto-install of Java class libraries	Yes	Unknown
Java JIT	Yes	Yes
Support for Java Beans	Yes	Unknown
Dynamic HTML class library	Yes	Unknown
Improved AWT	Yes	No
New AFC support	Yes	No
Enhanced signed Java applet access	Yes	Yes

### *Scripting*

Rather than only support Java, JavaScript, or LiveConnect and rely upon existing technologies being recreated in these languages, Microsoft Internet Explorer 4.0 supports the widest amount of programming and scripting languages so users can evolve their technologies to the Internet. With its support for ActiveX scripting, IE 4.0 provides the fast, comprehensive, language-independent script handling capability.

With scripting, ActiveX and Java controls can now access IE 4.0 dynamic new Object Model, which lets authors and developers manipulate pages dynamically as they add more interactivity. In addition, expanded support for ActiveX Controls makes it easier than ever to create powerful applications for the Web.

With Netscape, the only scripting you can use is JavaScript, which greatly reduces your flexibility to leverage existing capabilities and applications.

Browser Features	Internet Explorer 4.0 "The Web PC"	Netscape Navigator
<b>Scripting</b>		
<b>Scripting</b>		
Scripting of Java Applets	JavaScript and VBScript	With JavaScript only
Support for Java applet "sandboxing"	Yes	Yes
Support for native document formats (such as Word.doc or Excel.xls) within the browser window	Yes (ActiveX Documents)	Requires Ncompass plug-in (not included)
VBScript	Yes	Requires Ncompass plug-in (not included)
JavaScript-compatible scripting	Yes	Yes
Integration of objects and scripts	Yes	Partial
Scripting of Plug-ins	Yes	Yes

### Multimedia

The Web gets more exciting every day as Web pages come alive with new multimedia capabilities such as movies, sounds, animations, and 3-D worlds. IE 4.0 supports all the latest multimedia standards — including the Virtual Reality Modeling Language (VRML) 2.0 — and makes viewing multimedia over the Internet faster and more fun.

Web developers will find it's easier than ever to use multimedia effects to create compelling, interactive Web pages. IE 4.0's new Dynamic HTML technology enables you to add filters and transitions to your pages, create effects that work on a timer, and alter the surface of a bitmap.

In addition, IE 4.0 adds the following to help add multimedia to Web pages:

- ◆ **New Multimedia Controls (iHammer).** Exciting, low-bandwidth multimedia effects.
- ◆ **Interactive Music Control.** A new control that can create music on the fly.
- ◆ **ActiveMovie Control.** A control that provides cross-platform video and audio technology.
- ◆ **NetShow.** Broadcast multimedia events over the Internet or a corporate intranet.
- ◆ **Hottest VRML/3D Control.** Walk through virtual chat worlds, virtual neighborhoods and online shopping malls with rich social interaction and immersive sensory experiences.

NetShow and Active Movie support most standard video and audio formats and are easily extensible for support of future technologies

Interactive Music adds significant value over RealAudio, wave, and linear MIDI. Rather than relying on inconsistent music playback from soundcard to soundcard, the Microsoft Synthesizer in Interactive Music emulates that of a sophisticated collection of musical instruments to make each soundcard provide high-quality accompaniment.

Multimedia is another area where Netscape has not shown any interest in advancing its users' experience on the Web. Microsoft is committed to developing improvements across the board in all web technologies which will bring a richer experience to the user.

Browser Features	Internet Explorer 4.0 "The Web PC"	Netscape Navigator
<b>Multimedia</b>		
<b>Multimedia - Using ActiveX Controls to make your Web pages come alive!</b>		
Multimedia Controls	Yes (iHammer)	No

Browser Features	Internet Explorer 4.0 "The Web PC"	Netscape Navigator
<b>Multimedia</b>		
Interactive Music Control	Yes	No
Progressive Playback of Video/Audio files	Yes	Yes
In-line (streamed) sound support	NetShow, RealAudio and other ActiveX Controls	Live Media, Real Audio plugin
Video Streaming support	Yes	Yes
Native QuickTime video playback	Yes (ActiveMovie™)	No, requires Apple QuickTime plug-in
Native MPEG video/audio playback	Yes (ActiveMovie)	No
3D Animation	Yes (Direct3D)	Yes (Live3D)
VRML 2.0 with 1.x Compatibility	Yes	Yes

## Performance

The number one complaint about the Web from home users is that it is too slow. Microsoft is working hard to make the entire Web experience faster for users: from providing locally cached pages for favorite sites, to improving download times, to developing innovative Dynamic HTML that brings powerful multimedia effects to the desktop with reduced bandwidth, and by providing the fastest Java performance. And by integrating the Web with the Desktop, the user never needs to wait for the browser to start up. IE 4.0's integrated shell is faster than the existing Windows 95 shell with no new features enabled, and is faster than the Windows 95 shell plus IE 3.0 with WebView or the HTML desktop enabled.

As discussed earlier, Netscape force-loads all of its clients into the RAM working set of the user's computer, regardless of whether the user needs a particular client. This may allow the individual client to load slightly faster, but is not an effective use of the users computer resources.

Some of the key features IE 4.0 includes which improve performance are:

- **Dynamic HTML.** Dynamic HTML lets Web authors create richer, interactive pages while reducing bandwidth requirements.
- **Java Just-In-Time compiler.** Includes a new, open, backwards-compatible compression technology so that classes download to your computer faster.
- **Hybrid Cache (next release).** Hybrid Cache (think of fast cache) lets ISVs and ICPs extend and reserve the IE 4.0 cache to create a customized cache that can reside on the local file system.
- **Direct CD-ROM support (next release).** This will give content providers the ability to author content that directly accesses the CD-ROM.
- **Partial HTTP 1.1 compatibility.** This new version of the standard protocol speeds up content downloading. By next release, IE 4.0 will include support for several specific performance enhancing http 1.1 features.

Browser Features	Internet Explorer 4.0 "The Web PC"	Netscape Communicator
<b>Faster</b>		
<b>Performance &amp; Size Features - Making the Internet accessible to everyone</b>		
Native Shell Integration	Yes	No
Dynamic HTML	Yes	No
Fast Java VM/JIT	Yes	Yes

<b>Browser Features</b> <b>Faster</b>	<b>Internet Explorer 4.0</b> <b>“The Web PC”</b>	<b>Netscape</b> <b>Communicator</b>
HTTP 1.1 support	Partial (performance improvements)	Unknown
Fast Cache	Yes	Unknown
Direct CD-ROM support	Yes	Yes
Partial download support	Yes	Unknown
Minimum hardware	486/8MB	Unknown
Pluggable Custom Content Delivery Protocols	Yes	Unknown

## **Provides Protection on the Internet**

The Internet provides you with a convenient and effective way to communicate and share information with others worldwide. However, many users increasingly rely on the Web to use new applications such as online banking and shopping. Along with this increased reliance comes a greater need for security on the Internet. With its strong support of standard Internet security protocols, IE 4.0 lets you communicate privately, protect your identity, shield yourself and others from inappropriate content, prevent others from tracking your activities, and gain greater control over what software to download on your computer. This means you can conduct transactions and participate in consumer services on the Internet with complete privacy and security.

Netscape Navigator 4.0 and IE 4.0 both support client authentication using a digital or “personal” certificate to identify users to Web servers. Both browsers also support server authentication, in which servers identify themselves to users through a “server” certificate. This authentication ensures that end-users and servers are communicating with their intended parties. Both suites also employ SSL 2.0/3.0, a Netscape-developed protocol intended to provide secure communication over a TCP/IP connection.

Beyond these features, IE 4.0 supports:

- ◆ ***Code-signing with Authenticode™ technology***. Provides accountability for web executables, including Java applets, Navigator plug-ins, and ActiveX controls. Sun and Netscape are following our lead and have proposed code-signing architectures.
- ◆ ***Enhanced “Sandbox” support***. Besides fully supporting the “sandbox”, Internet Explorer 4.0 will provide a capabilities-based sandbox security model, which presents users with a range of security options, such as allowing a Java applet to access 100K of a computer.
- ◆ ***PICS***. Ratings services protect your family or business from inappropriate content. Despite working with the PICS committee, Netscape's Navigator 3.0 and now Communicator do not yet include PICS support, even though the number of sites using it are growing daily. Netscape has now said that they may support PICS at some future undefined date. This means families with children and corporations who both desire to keep their children or employees from accessing undesirable content have no ability to lock out such content if they use Netscape products.
- ◆ ***Microsoft Wallet***. A digital wallet where you can securely store personal information such as credit card numbers, Digital Certificates, and Digital Keys.
- ◆ ***CryptoAPI 1.0***. Provides the underlying security services for the Microsoft Internet Security Framework, and specifically for secure channels and code signing. This security architecture provides a degree of extensibility that is unmatched by Netscape’s proposed security native API, SNAPI. Some of the potential problems with SNAPI are that it: won’t be available until late 1997, hasn’t been approved for export, essentially re-invents the CryptoAPI - which will just serve to fragment the developer and industry communities.

- ◆ **Transport Layer Security (TLS).** In the near future, Microsoft will add support TLS, a new secure channel protocol currently under development by the (IETF).
- ◆ **Personal Information Exchange (PFX).** This set of public key-based security technologies, which is part of the Microsoft Internet Security Framework, supports Internet standards such as X.509 and PKCS#7 certificate formats.
- ◆ **Smart Card Authentication (PKCS #11 support).** IE 3.0 (and now IE 4.0) are enabled for smart card authentication (using SSL or PCT) through CryptoAPI. Our solutions have general export approval and allow replaceable cryptographic providers which Netscape's PKCS #11 solution doesn't provide. Use of PKCS #11 to provide only a smart card digital interface for authentication purposes does not offer the richness of functionality, growth options, and flexibility offered by the Microsoft CryptoAPI-based architecture.

Browser Features	Internet Explorer 4.0 "The Web PC"	Netscape Navigator
<b>Security</b>		
<b>Secure Communication and Interaction</b>		
SSL 2.0/3.0 support, PCT 1.0 support	Yes	Yes/No PCT support
Client & Server authentication	Yes	Yes
Code signing for Navigator Plug-ins, ActiveX Controls	Yes (Authenticode)	No
Code Signing for Java Applets	Yes (Authenticode)	Yes
Support for Java applet "sandboxing"	Yes	Yes
Enhanced Java applet security (out of the sandbox)	Yes	Yes
PICS ratings	Yes	No
Wallet	Yes	No
Personal Information Exchange (PFX)	Yes	Unknown
Smart Card Authentication (PKCS #11)	Yes	Limited
Cryptographic API	Yes	No

## Complete Communication & Collaboration

The Web provides the opportunity for unparalleled communication and collaboration. Along with communicating through the medium of Web page publishing, features such as Internet telephony, data and video conferencing, mail, news, chat, and application sharing are integral to complete communications. With Outlook Express, NetMeeting, NetShow, and FrontPad, IE 4.0 once again sets the standard for Internet communication and collaboration.

All IE 4.0 suite applications share consistent menus and toolbars, a common address book, and an integrated suite switching toolbar on the Taskbar. In addition, IE 4.0 provides integrated subscription and offline support, which will benefit all users trying to minimize their Internet connection time, including laptop users.

The communication features in IE 4.0 include:

- ◆ **Outlook Express**, an easy to use, full featured email and news client that supports all of the latest Internet protocols such as SMTP, POP3, IMAP, LDAP, MHTML and S/MIME.
- ◆ **NetMeeting**, which offers unmatched data conferencing (multipoint true application sharing, chat, whiteboard, and file transfer), audio conferencing/Internet telephony, and video conferencing.
- ◆ **NetShow**, the groundbreaking multicast and on-demand audio/video client.
- ◆ **FrontPad**, a simple, web-page and general HTML authoring tool.

- ◆ *Personal Web Server and Web Publishing Wizard*, which let users publish web pages as easily as sharing a folder on a PC.

## **Messaging & Discussions**

Email clients have become the most popular Internet application in the world, followed closely by programs that read and send messages to newsgroups. Outlook Express, which ships with the IE 4.0 Platform Preview, opens the door to a whole new level of electronic communication.

### ***Scalable, Flexible Solutions***

Microsoft messaging clients offer better solutions to a wider array of users than Netscape's one-size-fits-all solution. Besides offering a superior entry-level mail client as part of IE 4.0 for free, Microsoft also offers Outlook, a powerful messaging and collaboration client for the enterprise. Microsoft has developed both products with a uniform user interface and protocol support to make it a natural step when moving up from Outlook Express to Outlook's rich intranet collaboration client. For customers with existing applications or investments, IE 4.0 offers built-in extensibility, so it is easy to integrate third party-clients into the Internet Explorer environment.

Netscape's product does not come with modular messaging components. You can't plug in another enterprise mail system to Netscape Communicator — you have to use theirs, regardless of how much you may have invested in an existing system. Netscape Communicator actually force-loads their Messenger and Collabra clients into the RAM working set of the user's computer, whether or not the user wants to use them. Netscape has taken a much less customer-friendly approach than Microsoft has in IE 4.0, where you can opt to substitute other products for bundled components with no RAM hit.

### ***Standards Support***

Outlook Express is completely Internet standards-based. It supports today's most important mail, news, and directory standards, providing interoperability with other mail clients using the Internet. Outlook Express supports: SMTP, POP3, IMAP4, LDAP, MHTML and S/MIME, enabling seamless communication and improved security across corporate intranets and the Internet.

### ***Rich HTML Mail & Discussion Authoring & Viewing***

A major enhancement to Outlook Express is its ability to view and author rich HTML mail and discussion messages, bringing graphics, text, interactive forms, hyperlinks, animation, multimedia files and even video to messages. The benefits of rich HTML mail range from sharing greeting cards, complete with pictures, sound and video, to enhancing business processes through the use of electronic forms and secure email.

Netscape developed an early example of the benefits of HTML-based mail with their InBox Direct program. But Microsoft has taken the next step in content delivery, allowing the user to select any Web site and have its contents delivered to his or her mailbox. Unlike Netscape's approach, Microsoft offers the same capability to view and send rich HTML mail, but without the restrictions of only being able to subscribe to a select number of content providers. IE 4.0 is smart enough to create its own HTML mail, from any web site. Content providers can deliver rich HTML mail to any IE 4.0 user without the limitations set by Netscape's InBox Direct program.

### ***Outlook Express Features***

Besides offering full HTML viewing and authoring support, Outlook Express now includes powerful filtering capabilities, offline reading and composing, a global address books, tight integration with the rest of IE 4.0, sophisticated organization and composition and much more. Netscape's Messenger supports the same standards as Outlook Express, but lacks the complete integration, user friendly features, and some important functionality that Outlook Express offers. For example, Netscape's Messenger does not offer multiple POP and IMAP account support -- an essential component for the large number of Internet users who receive mail from multiple sources. Through extremely easy-to-use account

setup wizards, as well as an integrated account manager window, using this feature in Outlook Express is a snap.

Unlike Messenger, which offers only a difficult to find and hard to navigate "Message Center," Outlook Express can display a convenient starting page where users can click on icons that take them directly to their e-mail, newsgroups or address book. From the starting page, which is integrated into Outlook Express's unique three-pane view, they can even update subscriptions, compose mail messages and read helpful online tips.

The news component of Outlook Express is much more than just a newsgroup reader. You can set up personal and group-shared discussion groups, using NNTP standards. Netscape's Collabra does not offer all of the features that users need when doing true collaboration. Users who need true collaboration should consider moving up to Outlook. Netscape has incorporated nonstandard extensions to NNTP to add this extra functionality to Collabra. Customers should be aware that they are investing in proprietary tags, which are only supported by Netscape servers, and which will drive up switching costs if they ever decide to switch away from Collabra.

The vast majority of end-users will not be well-served by the mid-range functionality of Netscape Collabra, which offers unneeded features for casual end-users (for a high price), and not enough features for those who need true collaborative software. Customers who require true collaboration will want to move up to Microsoft's Outlook.

<b>Communication and Collaboration Mail Features</b>	<b>Microsoft Outlook Express</b>	<b>Netscape Messenger</b>
<b>Mail Features – Communicating with others over the Internet</b>		
<b>Internet Mail Standards Supported</b>		
SMTP/POP3, IMAP4, LDAP, MIME, S/MIME,	Yes	Yes
MIME HTML	Yes ☐	Yes
<b>General Functionality</b>		
Multiple mail servers	Yes	Unknown
HTML Read and Author	Yes	Yes
Offline Mail and News support	Yes	Yes
Synchronization with offline IMAP folders	Yes	Unknown
Rich Mail filtering	Yes	Partial
Search Messages on server and on local client	Yes	Yes
Address Book available everywhere	Yes	Unknown
Can edit, receive, and send full-fidelity HTML messages	Yes	Yes
LDAP Lookup	Yes	Yes
<b>Personalization Features – Create your own productive environment</b>		
3-pane view	Yes—can have 1, 2, or 3 panes	No—only preview pane on/off
Configurable toolbar	Yes	No
Stationary Templates	Yes☐	No
<b>Secure Communications – Protect your communications and verify senders</b>		
Secure password authentication using SASL standard	Yes	No
Send encrypted and/or signed mail	Yes	Yes

<b>Communication and Collaboration News Features</b>	<b>Microsoft Outlook Express</b>	<b>Netscape Collabra</b>
<b>General News Features – Access to corporate discussions and worldwide news groups</b>		
HTML View & Compose	Yes	Yes
Multiple news servers	Yes	Yes
User-friendly discussion group names	No, non-NNTP standard	Yes (proprietary extension)
Threaded Message views	Yes	Yes
Bookmark discussion groups	Yes	Yes
Create internal discussion groups	Yes	Yes
Secure discussions with SSL 3.0	Yes	Yes

## **Complete Internet Conferencing**

Beyond asynchronous communication through email and discussion groups lies real-time communications, such as Internet telephony, data and video conferencing, chat, and true application sharing. Many types of users — those at home, students, employees of small businesses or large organizations — want to take full advantage of the global reach of the Internet or corporate intranet for richer and more effective real-time communications and collaboration. With Microsoft NetMeeting 2.0, IE 4.0 continues to set the standard for real-time Internet/intranet communication and collaboration.

Available on both Windows 95 and Windows NT in more than 20 international languages, NetMeeting 2.0 delivers a complete Internet conferencing solution consisting of a real-time communications client, and an open, extensible platform supporting standards-based audio, data, and video conferencing functionality. NetMeeting combines the power of the PC with the global reach of the Internet and the ease of the telephone, to transform everyday communications and collaboration into a richer and more effective experience. NetMeeting allows people to get together with their friends online or to meet new people.

In addition to supporting the H.323 standard for voice communications with Internet telephony and video conferencing, NetMeeting supports the T.120 standard for multipoint data conferencing. Support for these standards ensures that users of NetMeeting can connect and communicate with users of other conferencing products, and can take advantage of conferencing services that also support these standards. Because of its support for H.323, NetMeeting users can even make calls to regular phones via a connection to the PSTN (public switched telephone network). Both the ITU T.120 and H.323 standards have broad industry support, with more than 100 leading industry vendors announcing their intent to build products and services that use or are compatible with them.

Netscape has been slow to adopt open communication and collaboration standards on the Internet. Despite being a member of the International Multimedia Teleconferencing Consortium and announcing support for the International Telecommunications Union (ITU) T.120 and H.323 standards, Navigator 3.0 did not implement anything based upon these standards in its CoolTalk product. Netscape Conference only now adds support for H.323, and still lacks vital support for T.120 -- so other applications cannot interoperate with Conference -- thus making it inappropriate for corporate organization use. In addition, Conference is still only point-to-point, making it unusable for workgroup conferencing and collaboration. And unlike NetMeeting 2.0, which is backward compatible with NetMeeting 1.0, Conference is not backward compatible with CoolTalk.

<b>Communication and Collaboration Conferencing</b>	<b>Microsoft NetMeeting</b>	<b>Netscape Conference</b>
<b>Internet Conferencing Features - Communicating and Collaborating with others over the Internet</b>		
Standards-based conferencing	Yes (T.120, H.323)	H.323 only
True Application sharing (any application, only one user needs the application)	Yes	No



<b>Communication and Collaboration Conferencing</b>	<b>Microsoft NetMeeting</b>	<b>Netscape Conference</b>
Audio Conferencing	Point-to-Point (Multi-point enabled, G.723.1, G.711)	Point-to-Point (G.711)
Video Conferencing	Yes (H.323, H.263, H.261)	No
Data Conferencing (T.120 Multipoint)	Yes	No
LDAP Directory Lookup	Yes	No
Collaborative Whiteboard	Multipoint	Point-to-Point
File Transfer	Yes (T.127, multipoint)	Yes (proprietary, point-to-point)
Internet Chat	Multipoint	Point-to-Point

## **Broadcast**

The promise of the Web to bring rich, multimedia content to PCs is alluring, but the challenges inherent in sending live video streams over the Web are daunting. Along with bandwidth issues, there are infrastructure concerns of how to support a large number of video feeds to many people. Microsoft is one of the companies tackling this problem with NetShow, a component of IE 4.0.

NetShow includes both client and server components. It was first introduced as an add-on for Internet Explorer 3.0 and as a server component to the Internet Information Server 3.0. NetShow brings the power of broadcasting to the desktop, and complements NetMeeting as IE 4.0's two main delivery systems for multimedia communication. NetShow efficiently delivers content from one source to many on the Internet or an intranet, while NetMeeting is used for person-to-person and group interactive sessions. NetShow makes the web come alive with interactive content including audio, illustrated audio (images and sound), and video. NetShow adds the power of traditional broadcasting systems (audio and video) to HTTP.

There are several competitive products to NetShow, including Progressive Networks RealVideo and Netscape's LiveMedia Player. This comparison is between NetShow 2.0 and the LiveMedia Player.

Although Netscape likes to claim that all of their products are based on open standards and implemented with open protocols and infer that Microsoft products are not, this is just not the case. Microsoft has implemented more standards than Netscape has in NetShow 2.0. Microsoft believes an open industry standard protocol for streaming media is a positive step in delivering networked multimedia in intranets and over the Internet, and will continue to work with IETF on emerging standards.

It is important to note that Netscape's avowed focus is the enterprise customer. They have given up on providing the vast number of home users with a high-quality broadcast media viewer. Microsoft is committed to making NetShow the best scalable solution, so that it not only works well for home users with limited bandwidth Internet connections, but also works better than any of its competition for delivering high quality streaming video over high-bandwidth corporate networks. NetShow has accomplished this goal.

<b>Communication and Collaboration Broadcast</b>	<b>Microsoft NetShow</b>	<b>Netscape Media Player</b>
<b>Multimedia Broadcast Features – <i>Watch the Web!</i></b>		
Streaming Video playback	Yes	Yes
Streaming Illustrated audio (images synchronized with audio tracks)	Yes	Yes
Streaming audio	Yes	Yes
Live Audio IP Multicast	Yes	Yes

Communication and Collaboration Broadcast	Microsoft NetShow	Netscape Media Player
Video IP Multicast	Yes	No
File IP Multicast	Yes	No
Rich scheduling capabilities	Yes	No

## Authoring and Publishing

While HTML has made it easier for many people to become instant publishers, it still is not intuitive enough for absolutely everyone. To make it easy for anyone to now author web pages and general HTML documents, IE 4.0 now includes FrontPad – a WYSIWYG HTML editor based on the full-featured FrontPage 97. And to make it easy to host your web pages for others to see, IE 4.0 also includes the Personal Web Server and the Web Publishing Wizard.

### FrontPad

FrontPad will take you step-by-step through the process of creating Web pages, and is a great tool for editing existing HTML documents. FrontPad provides the user with an editor for the Internet Document (HTM, HTML) files and Internet Shortcut (URL) document types on their desktop. Not only is the desktop active, but it's customizable. FrontPad has been integrated into the IE 4.0 WebView wizard and includes specific commands supporting the customization of WebView folders.

FrontPad includes all of the features of the FrontPage 97 editor except for support for some premium features, such as the editing of frames, image maps, proofing tools, Denali scripts, preview in browser, and some WebBot components. Although FrontPad can not insert these features, it can render and roundtrip this HTML as well as support the editing of this HTML through its View HTML interface.

FrontPad tools include:

- ◆ *Personal Home Page Wizard*, walks you step-by-step through the process of creating a Web page.
- ◆ *Table Creation and Editing*, including column editing.
- ◆ *Forms* that can be added to your Web page for people to fill out and return.
- ◆ *Page Templates and Wizards*. If you're connected to a server running FrontPage server extensions, you can use form-related wizards and templates
- ◆ *Java Applet, JavaScript, Plug-In Support*. FrontPad supports top Internet technologies from throughout the software industry — including Microsoft's own ActiveX.

FrontPad offers more functionality than Netscape's Composer, and shares a user interface with Microsoft Office, ensuring that users who are already familiar with Office's toolbars can create effective documents in no time. And FrontPad can be easily upgraded to FrontPage for creating more complex web pages and sites.

### Personal Web Server

The Microsoft Personal Web Server (PWS) offers a way for users and corporations to publish Web pages on their own server, while the Web Publishing Wizard offer the opportunity to publish Web pages on their own or a third-party server. Their simplicity makes them perfectly designed for home users, schools, and corporate workgroups – anyone who wants to share information on the Internet.

Microsoft Personal Web Server turns any Windows 95 computer into a Web server, enabling easy publication of personal Web pages. Easy to install and administer, PWS simplifies sharing information on corporate intranets or the Internet. It is designed for small-scale peer-to-peer or small Web server usage.

As your Web server needs grow, Microsoft offers a full range of Internet/intranet Web server products. The software is fully integrated into the Windows 95 Task Bar and Control Panel, making it easy for users to start and stop HTTP and FTP services whenever they wish.

## Web Publishing Wizard

Until now, actually publishing Web information has not been for everyone. With IE 4.0, many casual Web users can use an easy, step-by-step way of easily hosting content for others. For example, in a corporation, individuals or workgroups can share information with each other or with a wider audience. Even experienced Web site developers can benefit from hosting their test pages with complicated engines such as forms or applications on their own PC, test them locally, and then upload them to the Web server when they feel they've debugged their code sufficiently.

Internet Explorer 4.0's Web Publishing Wizard (WPW) solves this need and makes it easy to post your own Web site to a your own computer or a stand-alone server. The wizard automates the process of copying files from your computer to the Web server. Just follow the step-by-step instructions, and the wizard does the rest. WPW can automatically post to a variety of Web servers.

Netscape does not offer comparable products to the Personal Web Server and Web Publishing Wizard.

<b>Communication and Collaboration HTML Authoring &amp; Publishing</b>	<b>Microsoft FrontPad</b>	<b>Netscape Composer</b>
<b>General Features – Easy HTML Authoring</b>		
Page Wizard and Templates	Yes☐	Yes
WYSIWYG editing	Yes	Yes
Table editing & creation	Yes☐	Yes
Import and convert images	Yes (will use if Office 97 filters installed)	Yes
Style pages	Yes	Yes
<b>Web Technology Tools</b>		
Netscape Plug-Ins	Yes☐	Yes
Java applets	Yes☐	Yes
JavaScript	Yes☐	Yes
Active X Controls	Yes	No
VB Script	Yes☐	No
<b>Publishing Tools</b>		
Web Publishing Wizard	Yes	No
Web server	Yes, Personal Web Server	No

## Information Delivery

Today, finding information on the Web is not only difficult; it is overwhelming. When users are asked the biggest problem they have with the World Wide Web, the number one response is getting the information they need. The wealth of information on the Web has raised the desire and introduction of

tools to push and pull selected information to the desktop. IE 4.0 improves upon the work in this area by making strides in **Personalized Information Delivery**.

IE 4.0 provides the richest and most complete way to send and access relevant, personalized information, be it Web pages, software components, or email messages. It is capable of viewing the broadest range of Web content and allows you to create your own personal workspace with just the information you care about. IE 4.0's Personalized Info Delivery will be available as a core part of the new IE 4.0 browser, and will be available on all OS platforms for which IE 4.0 is developed.

With Personal Information Delivery, users can now easily subscribe to any Web site they currently have access to, get notified of changes, and work with them offline. Subscriptions are free, except in those cases where you must already pay for access, such as at the Wall Street Journal. And in those cases, as long as you already have access, you can subscribe to the site. IE 4.0 ships with the best selection of content partners and channels, so users have a great experience as soon as they begin using IE 4.0. IE 4.0 can also help automatically download and maintain updated Java applets and ActiveX Controls on a user's machine. With IE 4.0 as the client, corporate accounts can use their current Web servers to deliver intranet information to employee desktops.

In addition to targeting delivery to the desktop or folders, users can choose to view subscribed content in their screensaver, a desktop ticker, in their mail, or while browsing offline. All of the components of the Internet Explorer suite share the same user interface, so it is easy to subscribe to news groups and mail accounts, as well as Web sites. Internet Explorer 4.0 makes it easy for users to access the vast majority of web content that is not designed for 4.0-level browsers, i.e. simple HTML content that is authored for 3.0-level browsers. *Any* web site can be subscribed to, read offline, or received in email.

While Microsoft recommends using the free Internet Information Server that is bundled in Windows NT, no special server is required for building desktop channels, and any HTTP server will do. The default delivery mechanism that ships with IE 4.0 just replicates HTML and other content/user preferences from a standard HTTP server to the desktop. However, IE 4.0's information delivery scheduling/notification agent architecture is transport-independent and extensible by third parties, so they can plug in their own delivery agents and add additional functionality. Of course all content delivery capabilities will be administratable, so corporations can tailor delivery features to meet their bandwidth, permissions, or memory constraints.

Netscape's Constellation is also designed to bring messages, applications, and updated Web site information automatically to your computer. While Netscape has indicated that Constellation provides an open architecture for third-parties to create their own sites, it is unclear whether they will allow them to use proprietary transport mechanisms. Netscape relationship with Marimba for push-content suggests that they might emphasize the use of Marimba's proprietary transport protocol.

## **Premium Channels**

Premium Channels will be initially available "out-of-the-box" as premium content in IE 4.0. They are enhanced Web content sites that provide a richer, more accessible user experience than basic Web sites. Premium Channels are developed by content providers to exploit the latest advances in Web technology, such as Dynamic HTML, Java and ActiveX. As more content providers develop channels which take advantage of the richness of the Web PC channel capabilities, the user will be able to add them to his chosen channels. However, any Web site can be added to the user's IE 4.0 channel subscriptions, since the architecture is open and does not restrict users from adding whatever content they desire, unless done so by a corporate MIS group.

Netscape has indicated it is working on plans to form partnerships with content providers to deliver information to users via its channels within Constellation. It remains to be seen what breadth and quality of content offerings they will offer. Microsoft has a long history of developing content, and working with 3<sup>rd</sup> party content providers and developers to create dynamic software. We will continue to offer high-quality content in the online channel arena.

<b>Personalized Information Premium Channels</b>	<b>Internet Explorer 4.0 “The Web PC”</b>	<b>Netscape Constellation</b>
<b>General Features – Live Web Content available on demand</b>		
Exclusive Premium Channels	Yes	Maybe
Channel content type supported	Any HTML, Dynamic HTML, Applets, ActiveX controls	Unknown
Offline viewing	Yes	Yes
<b>Information Delivery Options</b>		
Live Channels	Yes	Yes
Smart Favorites	Yes	No
Site Subscriptions	Yes	Unknown
Delivered to mailbox	Yes, possible with <b>any</b> HTML web site	Limited to InBox Direct Content Providers
Mini channels (tickers, company phone directories, stock quotes, etc.)	Yes	Yes

## **Subscriptions**

A way to improve the user’s ability to get timely, relevant information, is to send a notification or email message when certain web sites change or when new information is culled from a web site. IE 4.0 provides this capability with its “subscriptions” feature. With Subscriptions, Web-site content can be automatically delivered to a user’s machine for viewing offline. Despite the name, subscriptions don’t cost the user anything unless they are to a site that independently requires payment for access. Using IE 4.0’s integrated user notification mechanism, multiple applications can feed information into this mechanism for display in a variety of places, such as a ticker, the taskbar, or the desktop.

Netscape has discussed a similar capability as part of Constellation called Notification. Like Subscriptions, Notification promises to keep you up-to-date on critical or time-sensitive information. Notifications can also occur in various places of the Constellation workspace. However, Notification may offer less functionality than Subscriptions when it comes to offline support, caching of Web pages, and email delivery. Netscape also makes no mention of the capability to delivery the Web page of your choice into your personal mailbox.

<b>Personalized Information Features Subscriptions</b>	<b>Internet Explorer 4.0 “The Web PC”</b>	<b>Netscape Constellation</b>
<b>Receive – Get the info you want</b>		
In a Desktop web component, channels and tickers	Yes	Yes
In Taskbars	Yes	No
In Mail	Yes	Only InBox Direct
<b>Notification – Know when you get the info</b>		
Email, Taskbar icon, Favorite tooltips	Yes	No
On the Desktop	Yes	Yes
Indication on Favorite icons	Yes	Yes
Subscription Status Folder	Yes	Unknown

## Offline Reading

Due to the expense of connection time and the hassles of waiting for Web pages to download, many users have a great need for offline Web support. By downloading important Web information at night or when they are not doing other tasks, users can more effectively use their online connect time. For users on the road with laptops with infrequent Web connections, offline Web reading is essential.

IE 4.0 offers Offline Reading. Now you can download entire Web pages, email, and even newsgroup discussions in a fraction of the time it takes to read them. IE 4.0, along with Outlook Express, can check a Web site, mail or news server for changes since your last visit and download any files that have changed. Users can schedule downloads for off-peak hours (saving connect time and money) or have Web content delivered on demand. To read content which has been downloaded, select Work Offline from the File menu, then open subscribed sites from either the subscriptions folder or from the Favorites menu. IE is also able to detect when the user is online and offline and switch into the appropriate mode (this is only partially implemented in Preview Release 1).

Netscape has only made brief comments about Communicator's and Constellation's offline capabilities, so it is difficult to compare them to IE 4.0's rich capabilities at this time.

<b>Personalized Information Features Offline Reading</b>	<b>Internet Explorer 4.0 "The Web PC"</b>	<b>Netscape Communicator &amp; Constellation</b>
<b>Offline Features – Get the info when you can, and access it when you want!</b>		
Integrated offline support for web sites, channels, mail, news	Yes	No
Download Favorite Web sites	Yes	Yes
Support site passwords	Yes	Unknown
Control how many pages deep you want	Yes	Unknown
Customized Download Schedule	Yes	Unknown

## Integration between the Web and the PC

The Internet has clearly become a necessary component of everyone's lives. It has developed into, for many of us, the fastest way to get the information we need to perform our daily tasks successfully. However, with current technology there is a distinct schism between two very different worlds: one containing local and network information, the other containing Intranet and Internet data. IE 4.0 eliminates that border, as it integrates the Internet into every aspect of your PC – your desktop, file folders, the network, even the Start Menu. Through rich integration with the operating system, Internet Explorer delivers True Web Integration with the Integrated Shell.

Internet Explorer 4.0 offers all the important features included in Navigator Communicator, but goes well beyond Communicator with a complete suite of powerful tools that meld the Internet into every aspect of your PC – including your desktop and file folders – to tightly integrate Web browsing, collaboration, and the Integrated Shell into one environment. As part of the new Integrated Shell, a new enhanced Start Menu and TaskBar provide quick access to your favorites, history, and the URL address bar, making it easy to launch the applications or sites used most frequently, whether they're stored locally, on the intranet, or the Internet.

IE 4.0's Integrated Shell becomes the user's home base for launching and switching between the Web browser and other applications, including office productivity software. It lets users stay abreast of what's happening around them, while providing a highly-customizable "dashboard" for information from the Web and other sources. IE 4.0's Active Desktop and Desktop Components integrate content, applications, and documents into a single, customizable workspace on the Desktop, including a ticker and screensaver

for real-time or cached updates. Every aspect is built around open, published standards, making it easy for ISV's, corporations, OEM's, or other partners to customize or extend this space.

The core components of Internet Explorer 4.0's True Web Integration include a *Single Explorer*, *Start for the Web*, and the *Active Desktop*.

## **Single Explorer**

Internet Explorer's Single Explorer is the one-window browser you get with the Integrated Shell. It provides a single user interface for accessing all data throughout the system for rich information publishing. True Web Integration turns Internet access into a seamless part of your operating system and PC. Now the Internet is instantly accessible from anywhere in your system, including your PC's desktop.

Although Netscape's Constellation claims to offer an integrated OS shell and Web environment, it only layers an HTML shell on top of the underlying OS. This approach consumes additional system resources and administrative overhead. Constellation incorporates web components onto its additional HTML layer, but does not take the next natural step forward, which is to integrate Web browsing with hard drive navigation and file management activities. As browsers continue to grow in size and functionality, using something like Netscape Constellation is equivalent to layering an operating system on top of your existing operating system, reducing performance and available memory for other applications.

The key features of the Single Explorer include:

- ◆ Browsing your hard disk and the LAN in the same window you use to browse the Web, using the same navigation tools.
- ◆ Single-click application and file launching, back/forward buttons, global favorites, etc.
- ◆ Richer, easier to use, customizable HTML views on commonly used or chosen folders ("Web View").
- ◆ Full-screen browser/file navigation with auto-hide toolbars.
- ◆ Corporations or end-users can create custom "Web Views" of folders.
- ◆ Create rich HTML views for file shares on any type of server. Use the "Customize this Folder" wizard to easily create your own "Web Views."
- ◆ New HTML-based help files.

<b>True Web Integration Features</b>	<b>Internet Explorer 4.0 "The Web PC"</b>	<b>Netscape Constellation</b>
<b>Single Explorer</b>		
<b>Simple, Consistent Navigation</b>		
Single click navigation and icon launching	Yes	Not on local hard drive or network file systems
Forward/backward buttons work everywhere (Web, PC, LAN)	Yes	No
Single window for navigating local and Web content (Browser enabled everywhere)	Yes	No
Unified toolbar adjusts for file management vs web browsing	Yes	No
Combined Web and local favorites	Yes (everywhere, including file system and Start Menu)	Partial (in browser and Constellation)
HTML viewing of file system	Yes	No
Switch natively between apps	Yes (Taskbar, etc.)	No
Native File Management	Yes	No
HTML-based Help	Yes	Yes

<b>True Web Integration Features</b>	<b>Internet Explorer 4.0 “The Web PC”</b>	<b>Netscape Constellation</b>
<b>Single Explorer</b>		

## **Start for the Web**

In developing the Windows 95 user interface, we learned from customers that a single, always-visible "anchor" for the environment makes the system easier to learn and easier to use. The Start menu and Taskbar together provide that anchor in Win95-- giving users one center-of-gravity for task-centric launching and switching. In IE 4.0, we extend those elements to integrate web tasks and to weave web-paradigms into a proven user interface that today's users have already made an investment in learning.

IE 4.0 enables application launching and switching via enhancements to the Windows 95 Taskbar and Start Menu. This extends the local functionality of your Start Menu and Taskbar to incorporate Web functions, as well as local improvements.

Netscape Constellation offers far fewer capabilities than IE 4.0 when it comes to creating customized, personalized toolbars for application launching, embedded HTML functionality and integration with the Windows 95 Taskbar. Constellation offers a different user interface for task launching and task switching than the Windows 95 Taskbar, and lacks the option for multiple toolbars, toolbar merging, toolbar docking, and all of the Start Menu and Taskbar features in IE 4.0.

<b>True Web Integration Features</b>	<b>Internet Explorer 4.0 “The Web PC”</b>	<b>Netscape Constellation</b>
<b>Start Menu &amp; Taskbar</b>		
<i>Start Menu-- More control and customization from the Start menu &amp; Taskbar</i>		
Launch Web icons	Yes	No
Contains your Favorite Web sites	Yes	No
Contains History List	Yes☐	No
Drag/drop customization of entire Start Menu, including Programs	Yes	No
<b>Taskbar and Toolbars</b>		
Allows creation of toolbars for launching files/apps/Web tasks	Yes	One Activity Selector Bar only
Can contain optional address, favorite links, or desktop shortcuts toolbars	Yes	No
Can contain Favorites, tickers, search forms	Yes	No
Toolbars can float, dock, or merge anywhere	Yes	No

## **Active Desktop**

With the importance of information on the Internet and on Intranets growing every day, it is clear that users need fast, simple ways to get to data. Before IE 4.0, users were forced to launch a separate application so that they could interact with Web content, and all web content was displayed in a different, highly constrained application window. But now IE 4.0 extends the local Desktop metaphor to include web-based information. The Active Desktop is the HTML-based desktop that comes with the Integrated Shell.

The Internet Explorer 4.0 Desktop, Start menu and Taskbar are your home base for launching and switching between applications, offering a much better environment for combining your favorite web



content and your natural Windows 95 environment than using a secondary shell, such as Netscape Constellation. IE 4.0's Active Desktop provides a highly-customizable workspace, bringing together local and Web-based information. You can now embed pieces (web components) of your favorite web sites (both from a corporate intranet or the World Wide Web) directly into your workspace. Some examples of the sort of information you could see using these capabilities are headline news, to-do lists, daily calendar reminders, email notifications, and telephone directories. IE 4.0 also includes a default screensaver, which subscribed sites can use to post pre-formatted content. The Screensaver rotates through selected offline-cached pages.

True Web Integration Features Active Desktop	Internet Explorer 4.0 "The Web PC"	Netscape Constellation
<b>Customizable Desktop – Add rich Web content to your desktop</b>		
Web Components on the desktop	Yes (natively)	Only in Constellation
Put any HTML content into a desktop component	Yes	Unknown
Easily add data from web sites via button-click or drag/drop	Yes	Unknown
Channel Bar	Yes☐	Yes
Screen Saver	Yes	Unknown
Create custom desktops and control	Yes☐	Yes
Automatically update content via Web	Yes	Yes
Offline caching	Yes	Yes
Rearrange/resize desktop components to any position via drag/drop	Yes	Unknown
Displays the pre-existing content on users native OS desktop	Yes	Unknown

### **Complete Administrative Features**

Technology purchase decisions are increasingly driven by considerations of Total Cost of Ownership, balanced by a need for best value. System administrators want to provide productive technology solutions at the lowest total cost, including the software purchase cost, the cost of initial deployment, the cost of upgrades, and the cost of maintenance and support. IE 4.0 will reduce all the ownership costs involved in managing a corporate Intranet. Besides being free (not only for the first version, but for subsequent upgrades also), IE 4.0 is easy to deploy, easy to upgrade, and easy to administer. But just as important is the extra benefit IE 4.0 brings to the company in terms of improved communications and improved work processes. Once you've deployed IE 4.0, your employees and customers can browse company files the same way they find information on the Internet. IE 4.0 provides one-click access to all the tools and content users want and need.

Whether you represent a corporation choosing the best browser/server for your intranet or you're looking at the Internet as a key part of your business plans, IE 4.0 and Microsoft servers (IIS, MCIS, etc) offer a complete solution: a rock-solid platform that delivers valuable new authoring opportunities and administration features, and the integration of the industry's best-of-breed browser with the Windows operating system to provide a new level of value for your organization and customers. And on top of all that is a large, committed force of Microsoft field representatives, ready to help you with your specific needs.

Internet Explorer 4.0 has been designed to offer superior integration with Windows NT Servers and is an integral component of the Zero Administration initiative for Windows.<sup>4</sup> By contrast, Netscape is providing "central administration" by re-inventing the corporate desktop to be a thin layer over the native OS, and then providing administration of just Netscape's applications, which is a sub-optimal solution. Netscape's approach requires a very large increase in the server infrastructure, which ignores existing investments and user preference for powerful, robust local clients. Microsoft's approach provides full administration over all applications (not just Microsoft's) and offers cost-lowering features across the board in operating systems, servers, and productivity tools (such as Office). The administration and deployment offering in Internet Explorer is one piece in a large solution for corporations, and therefore standardizing on this free intranet desktop is a wise investment for the IT executive who is trying to reduce cost and complexity in a corporate intranet.

Across the board, we feel that compared to Netscape's solution, the Microsoft client/server solution is more comprehensive, offers better features and performance, leverages your current investments, and is backed up by a superior field support staff.

### **Internet Explorer Administration Kit**

The Internet Explorer Administration Kit makes it easy to deploy IE 4.0 across many different machines and platforms in a corporation. The IEAK lets you redistribute the browser royalty-free and also customize and revise it to best suit your organization or customers' needs and personality. The Administration Kit makes it possible to reconfigure or lock-down group or individual user settings at anytime. This includes adding favorites to the browser menu, placing security restrictions on downloading Java Applets or ActiveX Controls, or completely customizing the content and user interface of the corporate desktop. The Administration Kit also provides support for roaming users using Win32 clients on Win NT servers, so users on a full-service intranet can roam from one machine to another on the same network without losing their personal settings, including their Active Desktop, favorites, subscribed sites, and Internet cookies. As an additional step to improve the ease of deployment, the Internet Explorer installation will migrate existing Netscape settings on a machine that is already configured to work with the Netscape browser.

Netscape's solution requires two components, their Administration Kit, which costs \$1995, and the AutoAdmin, which comes with each copy of their Pro version at \$79. There has been relatively little said about the AutoAdmin product. Microsoft's IEAK uses a Wizard to make it easy for the Administrator, yet offers very powerful customization and central administration features. Netscape's current Administration Kit, on the other hand, asks the user to edit a non-intuitive text file and then perform several labor intensive operations to develop a code installation. If Netscape's version of the Administration Kit for Communicator continues to use this primitive user interface and process, it will not offer a very useful central administration product.

<b>Complete Administrative Features Central Administration</b>	<b>Internet Explorer Administration Kit</b>	<b>Netscape Administration Kit &amp; AutoAdmin</b>
<b>Central Administration Features – IE 4.0 is designed to reduce your corporate cost of ownership</b>		
Price	Shipping & Handling only	\$1995
Easy, Single-step Wizard-based set-up	Yes	No
Pre-configuration of the desktop and browser by the administrator	Yes	Yes
Every aspect of the system can be configured or "locked down"	Yes	Yes
Hands-free setup in corporate deployment	Yes	Yes

<sup>4</sup> See <http://www.microsoft.com/windows/zerowp.htm> for more detailed information on Microsoft's strategy for reducing the cost of owning PCs

<b>Complete Administrative Features Central Administration</b>	<b>Internet Explorer Administration Kit</b>	<b>Netscape Administration Kit &amp; AutoAdmin</b>
Automatic migration of existing configurations	Yes (Netscape)	No
Automatic Proxy Configuration	Yes	Yes
Set-up and control/update User profiles	Yes (on Win32)	Yes
Multiple user profiles sharing same PC	Yes	Yes

## **Conclusion**

Microsoft Internet Explorer 4.0 is the first product to completely integrate the Internet with the PC, making it a more compelling, productive, and exciting solution for everyone. It beats Netscape Communicator's features across the board, and is a far easier solution to implement and use.

With Internet Explorer 4.0 you can now browse both the Web and your PC, moving between the two with unparalleled ease of use. Plus it's now easier to find information, and you can choose to have the information you want delivered for you to enjoy offline when the meter isn't ticking. For IS managers, Internet Explorer 4.0 represents a new, powerful information delivery tool that answers the needs of end users while integrating into corporate demands for easier and less expensive computing and communications tools. And finally, developers will find a rich new world of content they can create for distribution over the Internet or corporate intranets. Microsoft Internet Explorer 4.0 is a vast new step in the process of making computing better for everyone.