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

Competitive Guide - Draft

The Best of the Web, the Best of the PC

March 1997

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Microsoft Internet Explorer 4.0 vs. Netscape Communicator Competitive Guide

This document provides an informative framework for organizations and individuals to compare Microsoft® Internet Explorer 4.0 and Netscape Communicator for the Windows® 95 and Windows NT® 4.0 operating systems. This document should be read in conjunction with the *Microsoft Internet Explorer 4.0 for Windows 95 and Windows NT 4.0 White Paper*, which discusses in more detail many of the features mentioned here. Please refer to the Appendix for more detailed versions of the comparison tables presented in this document.

Executive Summary

Microsoft and Netscape are both planning to release their respective next-generation Internet client suites in mid-1997. While both products promise to offer users advances in technology and enhanced features, the two product strategies differ in vision and scope. Microsoft has a much broader vision for Internet Explorer 4.0, and our product offering is more comprehensive than Netscape's.

Internet Explorer 4.0 expands on Internet Explorer 3.0's innovations to achieve Microsoft's vision: complete integration of the Internet and the PC. This evolutionary product integrates the browser into the operating system, creating a single way to find, use, and work with all the information that users need, whether it's on their personal computer, a shared local network, or the World Wide Web. At the same time, Internet Explorer 4.0 is an open, standards-based, integrated suite of Internet software that includes the most advanced browser, communication and collaboration, and Webcasting solutions for end users, IT managers, and developers. An additional and important distinction between Microsoft's offering and Netscape's is that Internet Explorer 4.0 has been designed to solve the needs of both home users and business users.

Netscape Communicator and Netcaster offer a more limited vision and product offering than Internet Explorer 4.0 Their positioning is more akin to a set of middleware applications for business users to solve groupware needs, ignoring home user needs. Netcaster does not offer any integration with the underlying OS that Internet Explorer 4.0 does to create a truly integrated Web and native PC experience, plus Netcaster's information delivery model relies on proprietary protocols and does not support the proposed Channel Definition Format (CDF) standard. Communicator lacks the level of advancement that Internet Explorer 4.0 delivers in Web technology (such as site subscriptions, Dynamic HTML, and an object model for Web pages) and user enhancements (such as autocomplete URLs or search bar). And Communicator includes more proprietary standards (e.g., vCalendar), proprietary extensions (e.g., Collabra), and HTML tags (e.g., Layer).

Internet Explorer 4.0 brings incredible advances to browsing technology, allows for scaleable/open communication and collaboration, and enables the content of any Web site to be delivered directly to users' desktops. These advances make it easier for people to communicate with others, find relevant and personalized information, and create compelling Web content. The end result is a dramatically easier and more personalized way for users to get the most out of the Internet, enjoying a more entertaining and productive Web experience. Microsoft's broad vision for Internet Explorer 4.0's comprehensive suite of Internet applications includes the following benefits:

- ***The Best Browser*** for end users and organizations, as well as a next-generation development platform for content developers.
- ***Complete Communication and Collaboration***, providing HTML-rich, Internet standards-based applications that deliver audio/video/data conferencing, messaging, Web broadcasting, and discussion groups.
- ***Webcasting of Sites and Channels***, providing a rich and open authoring and publishing capability for sending and receiving information through either Web sites, channels, e-mail messages, or software components.
- ***True Web Integration***, which makes Internet access a seamless part of your operating system, and therefore your PC.
- ***Complete Administrative Features*** for businesses, so corporations have the best client for improved corporate communication, easy deployment and administration, and reduced total cost of ownership.

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The following table provides a high-level comparative overview of Microsoft Internet Explorer 4.0 and Netscape Communicator and Netcaster.

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Comparison Summary	Internet Explorer 4.0	Netscape Communicator & Netcaster
Browser & Web Technology	**Internet Explorer** • Significant step beyond Internet Explorer 3.0 • Ease of use & personalization enhancements • Comprehensive suite integration • Integrated offline browsing • True Dynamic HTML • HTML Object Model • Full ActiveX™ Support • Java™ Enhancements • Performance Improvements • Security upgrade & enhancements	**Navigator** • UI catch up to Internet Explorer 3.0 • Unrefined UI and usability • Few personalization features • Limited suite integration • Some offline capabilities • Still lacks full Dynamic HTML & object model • JavaScript-accessible style sheets • ActiveX promised, but still not implemented • Restrictive security model offers less functionality
Communication & Collaboration • **Mail** • **News & Discussion Groups** • **Real-time Conferencing** • **Broadcast** • **Authoring** • **Publishing** • **Calendar/PIM**	**Mail & News (Outlook™ Express, Outlook)** • Scaleable from Outlook Express to Outlook (corporate strength) • Standards-based (SMTP/POP3, NNTP, IMAP4, LDAP, MIME, S/MIME, M/HTML) • User can choose another mail & news client • Mail & news completely integrated • Multiple mail & news accounts **Conferencing (NetMeeting)** • Audio, video, and data standards (T.120, H.323, etc.) • Videoconferencing • True application sharing • Multipoint communications • LDAP integration **Broadcast (NetShow)** • Streaming audio & video • Audio, video, & data IP multicasting • Standards-based • Scheduling capabilities **Authoring (FrontPad)** • WYSIWYG editing • Wizards & templates **Publishing (Personal Web Server for Windows 95)** • Web Publishing Wizard **Calendar/PIM (Outlook)** • Corporate-level groupware functions with Outlook upgrade • Internet standard upgrade in development	**Mail & News (Messenger & Collabra)** • One-size-fits-all • Targeted at corps, yet missing key corp features • Proprietary extensions to NNTP • User forced to install mail & news client, even if not used **Conferencing (Conference)** • Only H.323 standard supported • No videoconferencing support • No application sharing (joint browsing only) • Point-to-point communications • Answer machine functions **Broadcast (Live Media Player)** • Streaming audio & video • Audio multicast only • Proprietary transport protocols & compression codecs **Authoring (Composer)** • WYSIWYG editing • Wizards & templates • No server **Publishing (not offered)** **Calendar/PIM (Calendar)** • Rudimentary calendar/PIM • Non-standard vCalendar protocol • Not sufficient for corporate environment
Webcasting of Sites and Channels • **Channels** • **Subscriptions**	• Supports Channel Definition Format (CDF) • Open delivery architecture acts as client to any backend channel service • Integrates Channels and Subscriptions with existing OS and user interface • Multiple delivery & notification options • Any Web site can be a channel • Ability to subscribe to any Web site • Premium Channels • Shows any HTML/Web content	• No CDF support, no delivery optimization • Delivery protocol restrictions (Marimba) • Fewer user options • Includes some premium content • Subscription function unclear • Creates new layer on top of OS for channels • Requires changes to content on servers to be a channel
Web Integration • **Single Explore** • **Start Menu & Taskbar** • **Active Desktop**	• Familiar UI for Windows 95 and Windows NT user • Seamless – one UI for navigating the PC and Web • Native file management & HTML viewing of file systems • Web tasks and components in the native OS taskbars and desktop	**Netcaster Features** • Web Integration features removed from Communicator/Netcaster • No file management features • Only provides for docking a web-page as the webtop, lacks personalization features
Centralized Administration	**IE Administration Kit** • Easy set-up and central administration • Roaming users and multiple user support on clients running Windows 95 or Windows NT Workstation with Windows NT-based server networks • Auto migration of existing desktop configurations • Ability to create custom Web-based user environments and centrally manage them	**Netscape Administration Kit and Auto Admin** • Removed roaming user support, still not enough focus on management tools • No easy migration of existing configurations • Ability to create custom Web-based user environments (webtops) and centrally manage them

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With Communicator and Netcaster, Netscape is focusing primarily on intranets and business users. Unfortunately, they leave out the entire home and small business markets, while only partially solving the needs of business users. Microsoft sees two distinct market segments in terms of collaboration: basic collaboration and full collaboration. For basic collaboration—such as e-mail, application sharing, and chatting—Internet Explorer 4.0 is the premium, best-of-breed client. The other portion of the market, which needs high-end collaboration solutions, should compare Communicator's limited offerings with the more complete solutions found in Microsoft Exchange and Outlook products, or in IBM's Lotus Notes. Microsoft's solution is designed to offer a scaleable set of communication and collaboration clients that allow users to select which is most appropriate for them. For the user who needs basic collaboration, Microsoft believes that Internet Explorer 4.0 offers a much better solution than Communicator, while also 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 monolithic program, which operates on top of the native operating system. Netscape has chosen to provide a one-size-fits-all set of communication applications that all Communicator users are forced to install, regardless of their needs. For example, if you have already standardized on an e-mail system and you install Communicator, you will now have two e-mail clients installed on every system. Additionally, your production e-mail client will not integrate into Communicator. Microsoft understands that the investments organizations and users have made in e-mail clients cannot be taken lightly, and therefore has designed Internet Explorer 4.0 to be open and to interoperate fully with any e-mail client.

Netscape had originally planned to include an overlying shell on top of the underlying operating system with Constellation. They have removed that functionality from Netcaster. This is a wise move, considering a new "shell"—or layer—on top of the existing operating system would have required substantial investments in training and support. Microsoft understands that organizations and users have already made investments in training, and certainly want to take advantage of that investment. Instead of adding another layer on top of the OS, Internet Explorer 4.0 extends Windows to naturally take advantage of Web tasks. Microsoft is committed to bringing Internet Explorer 4.0's advances in the browser, content delivery, and communications to the Windows 3.1, Macintosh, and Unix platforms.

Netscape has also removed its originally planned roaming user support from Netcaster. Microsoft believes that the more important near-term issue is to provide powerful and easy-to-use central administration capabilities for corporate MIS, so that they can effectively control costs while improving overall productivity. And of course, Internet Explorer 4.0 takes advantage of the capabilities that already exist in the Windows 95 and Windows NT operating systems, running on Windows NT-based server networks, to enable roaming user- and multiple user-support.

Finally, Internet Explorer 4.0 enables a business model that allows content developers and corporations to use 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 use Internet Explorer 4.0.

Features that are not implemented in the Internet Explorer 4.0 Platform Preview release but are planned for the next Internet Explorer 4.0 release are called out with a **(next release)** or the symbol ➲. Features that are planned for the final product, but which probably will not make it into the next release, are called out as ***planned***. Features that Netscape has said will be in Communicator, but which are not yet implemented, are marked with an **NYI**.

The information contained in this document represents the current view of Microsoft Corporation on the issues discussed as of the date of publication. Because Microsoft must respond to changing market conditions, this document should not be interpreted to be a commitment on the part of Microsoft, and Microsoft cannot guarantee the accuracy of any information presented after the date of publication.

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The Best Browser

The most important aspect of having a great Web experience comes from the strength of the browser. Browsers should be judged and compared on the following four key areas:

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

Internet Explorer 4.0 provides the easiest, fastest, and most useful way to browse the Web. It does so through unique performance and usability improvements, drag-and-drop customization, easy navigation of URLs, and enhanced searching, to name just a few. Making browsing more useful also involves continuing to lead the way in supporting Internet protocols and standards that result in more exciting and rewarding content for end uses to access. Thus Internet Explorer 4.0 supports the widest range of Internet standards available today including HTML, Java, ActiveX, and both JavaScript and Visual Basic Scripting.

Ease of Use Innovation & Personalization Enhancements

User interface features, such as ease of use and personalization, should be judged by how easy it is for users to discover and effectively use these features, and how well the UI enables the user to accomplish tasks. At the same time, these features should not overwhelm the user with additional complexity. The best features are ones that the user doesn't have to search out, they just happen when appropriate. Microsoft considers usability to be one of its top most concerns when developing software, and the IE team expends a great deal of effort to make IE easier for the user, even while making it more powerful.

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 a much easier way to search the Internet 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 you having to visit each Web site and you making the determination whether the information has changed, IE 4.0 looks at your Favorite sites, and informs you of - content changes, when you last visited, and when the site was last updated - before you even visit the site. This way you can decide whether it's worth visiting or not.

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:

- **AutoComplete.** The Address Bar in IE 4.0 automatically completes addresses for users, and provides auto completion history on mouse right-click.
- **Search Bar.** Keeps a list of search results in view while the user explores the sites listed.
- **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.
- **History Bar.** The History Bar 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.

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- **Smart Favorites.** Users can find out automatically when their favorite sites were last updated, when they last visited, and what new content is available. 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 Ease-of-Use & Personalization	Internet Explorer 4.0	Netscape Navigator
Ease-of-Use, Personalization & Fun Features *Making the Internet easy for everyone*		
AutoComplete Address Bar	Yes	No
Integrated Search Bar	Yes	No
Suite Integration w/easy suite member switching	Yes	Partial
Smart Favorites which check Web site for last update, last visit, new content	Yes	No
Drag & drop to favorites toolbar or menu	Yes	Yes
Reorder links using drag and drop, natively in Favorites menu	Yes	No
Thumbnail view of Favorite sites, and on any folder	Yes	No
Offline browsing	Yes	Unknown
Enhanced Navigation history available on Back/Next buttons	Yes	Yes
Reorder and Combine Toolbars	Yes	Reorder only
Use Mail/News client of choice	Yes	No
Full-screen browser & Kiosk modes	Yes (full-screen)	Yes
User-friendly Error, alert & status messages and sound events	Yes	No
International Language Support	9 (Preview) 25-30 (final)	11 languages planned (final)
Distribution/Administration Kit	Yes	Yes

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.

Browser Features Offline Reading	Internet Explorer 4.0	Netscape Navigator
Offline Features – *Get the info when you can, and access it when you want!*		
Integrated offline support for Web sites, channels, mail, news	Yes	No
Download Favorite Web sites	Yes	NYI
Support site passwords	Yes	Unknown
Control how many pages deep you want	Yes	Unknown

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Browser Features Offline Reading	Internet Explorer 4.0	Netscape Navigator
Customized Download Schedule	Yes	Unknown

Best Implementation of Internet Standards

The key to advancing the Web experience is to provide the best implementation of standards. As such, Internet clients should be judged on how well they implements existing and emerging standards. Credit should also be given for innovation and success at working with the standard bodies in developing these new standards.

Now, people can view and listen to real-time webcasts, watch videos, run ActiveX controls and Java applets, and play interactive, multi-player 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

In October 1996, at the Site Builder Conference, Microsoft announced Dynamic HTML (see the Dynamic HTML Fact Sheet at http://www.microsoft.com/activeplatform/plat-gen/dhfact.asp). Dynamic HTML gives users unprecedented speed and interactivity with Web pages and provides Web site developers enhanced creative control over the appearance and behavior of Web pages. Dynamic HTML provides interactive content with higher performance because they require fewer round trips to the server. Dynamic HTML provides rich multimedia capabilities, removing creative boundaries. Dynamic HTML will be delivered on the Macintosh, Windows, and UNIX platforms as part of Internet Explorer 4.0

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 another 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, as was the Document Object Model, which Microsoft's Dynamic HTML object model is based on. The primary positioning proposal in the W3C is the IE 4.0 absolute positioning proposal, which is actually being co-authored by Microsoft and Netscape. Microsoft has been working closely with the W3C and will enhance future versions of IE to conform to W3C recommendations.

Unlike other browsers, Microsoft Internet Explorer 4.0 allows changes to styles, positioning, and content at any time -- not only when the page is loaded -- through Dynamic HTML. Netscape Communicator allows content and styles to be updated via JavaScript-Accessible Style Sheets (JASS), but **only at load-time** -- thus, not dynamically.

Netscape claims to offer "dynamic HTML," by supporting JavaScript Accessible Style Sheets (JASS) and Layers in Navigator 4. Netscape has proposed both technologies, JASS and Layers to the W3C. The W3C has rejected Netscape's Layer Proposal, but Netscape still markets their proprietary Layer Tags (LAYER / ILAYER) on their web site and supports them in Communicator beta 2. And although Netscape's JASS proposal is still under consideration at the W3C, it does not allow authors to update page content or styles after the page has loaded, unlike Microsoft's Dynamic HTML. Netscape lacks the core features of true dynamic styles, dynamic content and the HTML object model, data binding and awareness, and dynamic HTML multimedia extensions.

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:

- ***Standards-based and cross-platform:*** Dynamic HTML is an implementation of W3C standards: HTML 3.2, Cascading Style Sheets (CSS) 1.0, and the Document Object Model (proposed to the W3C). Dynamic HTML

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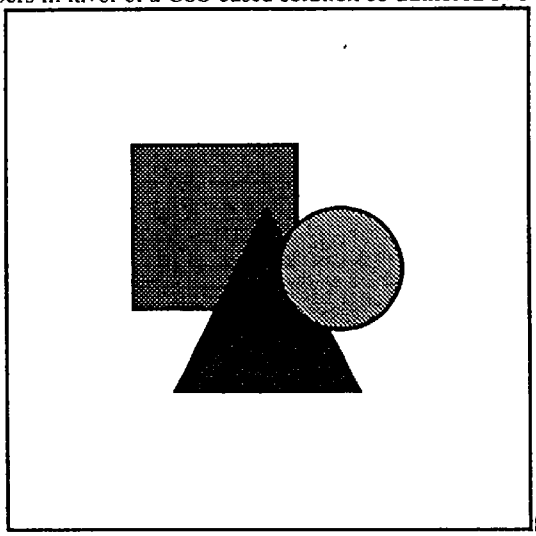
is compatible with all existing W3C standards. Dynamic HTML, as part of Internet Explorer 4.0, will ship on Macintosh, Windows, and UNIX.

- ***Dynamic Styles, Positioning and Content (HTML Object Model):*** Dynamically update a page without a server round-trip at any time -- even after download. Based on user actions (e.g., mouse click or mouse over) or a specified time after download, the page author can:
  - Show or hide an element, or change its characteristics at any time.
  - Specify the X, Y position and Z-order of any element at any time.
  - Change content and structure at any time.
- ***Multimedia and animation:*** Create dynamic visual effects such as filters, animation, and transitions, on page elements, entire pages, or between pages without scripting or downloading huge files or pages.
- ***Data Binding & Awareness:*** Integrate data with native HTML elements and automatically generate and expand tables and databound form fields; dynamically sort tabular data; query local tables.
- ***Script-driven and extensible:*** Supports JavaScript and Visual Basic® Scripting Edition (VBScript), and can be extended with Java applets and ActiveX™ controls.

Browser Features	Internet Explorer 4.0	Netscape Navigator
Dynamic HTML		
Dynamic Styles with updates at any time	Yes	No
CSS Compliant Absolute Positioning with Z-order	Yes	Yes
Dynamic Content (HTML Object Model)	Yes	No
Dynamic HTML Multimedia Extensions	Yes	No
Data Binding & Awareness	Yes	No
JavaScript-Accessible Style Sheets (JASS)	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, JavaScript-Accessible Style Sheets (JASS), and tables — in essence increasing switching costs for customers by developing these proprietary solutions. Their table extensions contradict the standard that has been supported since HTML 3.2 (RFC 1952), and their layer tag has already been dropped for consideration by the W3C. This includes the Layer and Ilayer tags, which were voted down by the W3C members in favor of a CSS-based solution co-authored by Netscape and Microsoft (see



http://www.w3.org/pub/WWW/TR/ for all recommendations and working drafts) This may cause considerable future migration problems and most certainly will cause backward compatibility problems

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Browser Features	Internet Explorer 4.0	Netscape Navigator
HTML 3.2 & Compatibility		
HTML Support - *Employing standards to create great looking Web pages*		
HTML 3.2	Yes	Yes
W3C HTML OBJECT tag	Yes	Yes (NYI)
Enhanced Frames (borderless, inline, and floating)	Yes	borderless only
Compatibility		
Cascading Style Sheets (CSS1)	Yes (core + advanced)	Partial (core only)[1]
PICS ratings	Yes	No
File upload	Yes	Yes
Server push	Yes	Yes
Automatic Proxy Configuration	Yes	Yes
HTTP 1.1 support	Partial (performance enhancements[2])	Unknown
Downloadable Web fonts (True Type Std)	Yes	No (non-std Bitstream TrueDoc)
Unicode International character support	Yes	Yes
Rich Forms	Yes	Unknown

Beyond HTML: Powerful Application Support on the Web

While Dynamic HTML greatly improves the Web's ability to offer fast interactivity on the Web using HTML, it provides only some of the Web's potential for Internet interactivity. More powerful Web content demands applications such as ActiveX controls, Java applets 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 administrators and 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 by way of supporting the OBJECT tag. We can not currently evaluate their support, since it has not been implemented to date in the Communicator Preview Releases. You can be guaranteed, however, that Microsoft will provide the fullest and most effective ActiveX implementation.

[1] Implementation involves JASS, which means it is likely to create scripting errors for incorrectly implemented CSS1 tags, which is not very user-friendly.

[2] Persistent connections and pipelining

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Browser Features Interactivity	Internet Explorer 4.0	Netscape Navigator
ActiveX: *Using ActiveX to create the Webs most interactive pages*		
ActiveX Control Support	Full	Promised
ActiveX Control Viewer	Yes	No
Java Bean Support	Yes	No
ActiveX Script Debugger	Yes	No
Auto-Install and signing of plug-ins	Yes	Yes
Component Object Model		
Browser serves as reusable control for Integration into external applications	Yes	No
COM/DCOM Support	Yes	No
ORB/IIOP Support	No	Yes
Installable JIT architecture	Yes	No

Java

Java is another way to bring dynamic, interactive content and applications to the Web. The three important measures to compare are speed, stability, and functionality. Microsoft is committed to providing the best way to develop and run Java applications in a fast, robust and fully compatible way.

With IE 4.0, Java applications become even more powerful as Microsoft makes it easier for developers to create more full-featured Java applications for the Web. Although the Preview Release 1 does not include Microsoft's next generation Java virtual machine[3], it will be integrated into the next release. It offers a number of new features for developers and end users, including AFC, automatic and bi-directional integration of ActiveX components and Java Beans, JDK 1.1 support, even better international support, better package management and much more.

IE 4.0 will support all of the cross platform features of JDK 1.1, although they will not be fully implemented until the final release. Performance in IE 4.0 has been improved, too, making Java applications run even faster than our standard-setting performance in IE 3.0. This Preview Release does not include any of our performance enhancements.

In IE 3.0, Microsoft led the way with Java security through AuthentiCode™, by allowing signed Java applets and libraries out of the Java sandbox if the source was trusted by the user. In an ongoing effort to allow greater functionality while maintaining security, Microsoft, Netscape and Sun are following the trust model initiated by AuthentiCode and implementing a Java applets capabilities-based security model. IE 4.0 will offer a more intuitive and easier to use interface than Netscape, so that users will get the security they need, in an understandable way.

Browser Features Java	Internet Explorer 4.0	Netscape Navigator
Improved AWT (performance, robustness, size)	Yes	Partial
Advanced Class Libraries	Yes (AFC)	Yes (IFC)
JDK 1.1 cross-platform support	Yes	Yes (by final)
Java Beans support	Yes	Unknown
Automatic & bi-directional integration of ActiveX components and Java Beans	Yes	No
Dynamic HTML Object Model exposed to Java	Yes	No
Multimedia class libraries w/DirectX support	Yes	No
Auto-install of Java class libraries	Yes	Unknown
Just-in-Time Compiler	Yes	Yes
Capabilities-based security model	Yes (AuthentiCode™)	Yes

[3] You can install a pre-release version from the Microsoft Java site at http://www.microsoft.com/java/java.htm

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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's dynamic new object model, which lets 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 developer's flexibility to leverage existing capabilities and applications.

Browser Features Scripting	Internet Explorer 4.0	Netscape Navigator
Scripting of Java Applets	JavaScript and VBScript	With JavaScript only
True Dynamic HTML support	Yes	No[4]
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
All tags accessible with script	Yes	No
Full event model for all tags	Yes	No
Scripting of Plug-ins	No	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***. Exciting, low-bandwidth multimedia effects.
- ***Interactive Music Control (add-on)***. 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 (add-on)***. 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.

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[4] By Dynamic HTML, we mean that changes made to the structure, content, or style of the document in script are immediately reflected in the document without having to refresh the document

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Multimedia is another area where Netscape has not shown much innovation in advancing the 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 Multimedia	Internet Explorer 4.0	Netscape Navigator
Multimedia - *Using ActiveX Controls to make your Web pages come alive!*		
Multimedia Controls	Yes (via Dynamic HTML)	No
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)
3D Sound	Yes	Yes
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 Performance	Internet Explorer 4.0	Netscape Communicator
Performance & Size Features - *Making the Internet accessible to everyone*		
Native Shell Integration	Yes	No
Dynamic HTML	Yes	Partial
Fast Java VM/JIT	Yes	Yes (NYI)
HTTP 1.1 support	Partial (performance improvements)	Unknown
Fast Cache	Yes	Unknown

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Browser Features Performance	Internet Explorer 4.0	Netscape Communicator
Direct CD-ROM support	Yes	Yes
Partial download support	Yes	No
Minimum hardware	486/66: 8MB RAM (Win 95), 16MB RAM(Win NT)	486 (processor not specified): 8MB RAM (Win 95), 16MB RAM (Mac PPC and UNIX)
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, verify 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 support SSL 2.0/3.0, a Netscape-developed protocol. IE also supports PCT, a Microsoft developed security protocol. Both provide secure and authenticated communication over a TCP/IP connection.

Beyond these features, IE 4.0 supports:

- ***Code-signing with Authenticode™ technology***. Insures accountability and integrity for Web executables, including Java applets, Navigator plug-ins, and ActiveX controls. IE 4 will also automatically check to see if the digital certificate presented by the publisher of the downloaded software is still valid. Sun and Netscape are following our lead and have proposed code-signing architectures for their future products.
- ***Enhanced "Sandbox" support***. Besides fully supporting the Java "sandbox", Internet Explorer 4.0 will provide a capabilities-based sandbox security model, which presents users with a range of security options.
- ***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.
- ***CryptoAPI***. The Microsoft CryptoAPI provides an extensible architecture for developers to build exportable applications that take advantage of a full range of cryptographic services. CryptoAPI has always provided underlying security services for the Microsoft Internet Security Framework to include: client side authentication, secure channels, and AuthentiCode™ support. This security architecture provides a degree of extensibility and compliance with US export regulations that is unmatched by Netscape's proposed SNAPI interface. With the introduction of IE 4.0, CryptoAPI also delivers a comprehensive and extensible public key certificate management system in support of digital IDs.
- ***Transport Layer Security (TLS)***. Once the draft specification is approved by the IETF, Microsoft will add support for TLS secure channel protocols to compliment existing SSL and PCT protocols.
- ***Microsoft Protected Store.*** A system service which will allow applications to store sensitive information on behalf of the user, including passwords, personal cryptographic keys, personal information, account numbers, etc.
- ***Microsoft Wallet***. A set of user oriented services, built on the Protected Store, which are optimized to support emerging electronic commerce services in a secure and easy to use manner. Its purpose is to store commonly

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required information, such as user personal data and credit card numbers, related to payment methods to simplify the purchase experience while maintaining user confidentiality.

- ***Personal Information Exchange (PFX).*** Allows users to transport personal private data between machines and across platforms using mechanisms, which build on existing security standards.
- ***Smart Card Authentication.*** IE 4.0 is enabled for smart card authentication (using SSL or PCT) through CryptoAPI. Microsoft solutions have general export approval and allow replaceable cryptographic providers - not supported by Netscape's proposed solution - to meet a broad range of user needs. Microsoft's approach provides a comprehensive smart card infrastructure to allow integration of applications ranging from electronic cash systems to health care systems to meet customers' diverse needs. Netscape's approach is limited to authentication use only.

Browser Features	Internet Explorer 4.0	Netscape Navigator
Security		
Secure Communication and Interaction		
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 and applications	Yes	Limited
Cryptographic API	Yes (CryptoAPI)	No (proposed only)

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. Once again, the key metrics to compare in this area are implementation of standards, integration with other applications, and rich functionality. 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 comprehensive 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, MIME, NNTP, 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.

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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 then 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 install 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 sending greeting cards, complete with pictures, sound, and video, to enhancing business processes with 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 it's 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 email, 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.

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The news component of Outlook Express is more than just a newsgroup reader. You can set up personal and group-shared discussion groups, using NNTP standards. Netscape has incorporated non-standard extensions to NNTP to add extra functionality to Collabra. Potential Netscape customers should be aware that they are investing in proprietary extensions, which are not interoperable with other clients or servers. When Netscape attempted to submit some of these extensions to the IETF at the last minute, they were rejected for flaws that would have rendered them unusable on the Internet. Fortunately, a previously submitted Microsoft draft on searching across newsgroups had been advancing steadily through the standards process.

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.

Communication and Collaboration Mail Features	Microsoft Outlook Express	Netscape Messenger
Internet Mail Standards Supported		
SMTP/POP3, NNTP, IMAP4, LDAP, MIME, S/MIME	Yes	Yes
MIME HTML	Yes ❶	Yes
General Functionality		
Can edit, receive, and send full-fidelity HTML messages	Yes	Yes
Multiple mail servers	Yes	Unknown
Offline Mail and News support	Yes (POP3)	Yes
Rich Mail filtering	Yes	Partial
Auto Watch Response Threads to my Messages	Yes	No
Search Messages on server and on local client	Yes (local)	Yes
LDAP Lookup	Yes	Yes
Automatic name resolution/auto-lookup from personal address book and LDAP servers	Yes	No (only auto completes on names in personal address book)
Personalization Features – *Create your own productive environment*		
3-pane view	Yes—can have 1, 2, or 3 panes	No—only preview pane on/off
Customizable Toolbar	Yes (dock on any side, add/change buttons, turn on/off text and background)	No
Stationery Templates	Yes	No
Secure Communications – *Protect your communications and verify senders*		
Secure password authentication using SASL standard	Yes	No
Send encrypted and/or signed mail	Yes	Yes

Communication and Collaboration Newsgroups & Discussions	Microsoft Outlook Express	Netscape Collabra
General News Features – *Access to corporate discussions and worldwide news groups*		
Customizable Toolbar	Yes (dock on any side, add/change buttons, turn on/off text and background)	No
HTML View & Compose	Yes	Yes
Multiple news servers	Yes	Yes
Threaded Message views	Yes	Yes
Auto Watch Response Threads to my Messages	Yes	No
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

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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 it's 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.

Communication and Collaboration	**Microsoft NetMeeting**	**Netscape Conference**
Live Conferencing		
Internet Conferencing Features - *Communicating and Collaborating with others over the Internet*		
Standards-based conferencing	Yes (T.120, H 323)	H.323 only
True Application sharing (any application, only one user needs the application)	Yes	No
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)
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. To be successful in this arena, products must be open to as many formats as possible, offer both direct and multi-cast capabilities, and provide an open framework for adding additional formats and standards as they evolve. 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

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for person-to-person and group interactive sessions. NetShow makes the Web comes 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.

Communication and Collaboration Live & On-Demand Broadcast	Microsoft NetShow	Netscape Media Player
Multimedia Broadcast Features – *Watch the Web!*		
Streaming Video playback	Yes	Yes
Streaming Illustrated audio (images synchronized with audio tracks)	Yes	Yes
Streaming audio	Yes	Yes
Live Audio IP Mu ..cast	Yes	Yes
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. The key to offering a good basic authoring and publishing capability is to provide the set of functions that most casual users would need, without overloading the product with complicated features only more advanced users would want. And then make it easy for users to upgrade to a higher level product when they want to.

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 Site Management, frame editing, 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.

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- ***Table Creation and Editing***, including column editing.
- ***Forms*** that can be added to your Web page for people to fill out and return. (You must be connected to a server running FrontPage server extensions to use these forms-related features.)
- ***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.

Communication and Collaboration HTML Authoring & Publishing	Microsoft FrontPad	Netscape Composer
General Features – *Easy HTML Authoring*		
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
Web Technology Tools		
Netscape Plug-Ins	Yes	Yes
Java applets	Yes	Yes
JavaScript	Yes	Yes
Active X Controls	Yes	No
VB Script	Yes	No

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Communication and Collaboration HTML Authoring & Publishing	Microsoft FrontPad	Netscape Composer
Publishing Tools		
Web Publishing Wizard	Yes	No
Web server	Yes, Personal Web Server	No

Information Delivery (Webcasting of Sites and Channels)

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. There are several important factors to consider when comparing information delivery options: personalization capabilities, integration with other Internet applications and the underlying operating system, standards support, an open architecture for different transport protocols and agents, access to premium content providers, and ease of use. IE 4.0 improves upon the work in this area by making strides in **Webcasting** of sites and channels.

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 Webcasting, 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. 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, 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

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Channel Definition Format

Microsoft has developed and submitted the industry's first channel definition format (CDF) for push technology to the World Wide Web Consortium (W3C). Internet Explorer 4.0 will implement CDF, optimizing the delivery of push content to the millions of users of Microsoft Internet Explorer. CDF is an open and easily authored format for the publishing of Web-standard channels that will allow Web publishers to optimize the broadcast of their content to millions of Internet users. CDF already has strong support, with more than 30 vendors rallying behind the CDF specification.

CDF offers developers several compelling benefits, including: an open format, proven technology, low cost, and the ability to use compelling Internet technologies in channels. CDF will be easy for Web developers to adopt because it is based on XML, which has support among many third parties. The CDF specification submission extends XML and Web Collections work that the W3C has in progress. These efforts will allow for open, HTML-based Web broadcasting based on standards-based technologies that are expected to have strong support among W3C members.

For Internet users, this means rich content broadcast seamlessly to their desktops. For Web publishers, the open and easily implemented content specification dramatically reduces costs and makes entry-level channel publishing possible with a standard Web server such as Microsoft Internet Information Server (IIS).

Microsoft is committed to contributing to the standards effort in defining CDF, which brings industry leaders, innovative developers and content publishers together around a common Web broadcast specification. Microsoft Internet Explorer 4.0's implementation of CDF, Dynamic HTML and other standards will enable any Web site to become a broadcaster, delivering personalized and timely information directly to users. We expect these efforts to make the Web more useful and exciting to millions of users worldwide.

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 3rd party content providers and developers to create dynamic software. We will continue to offer high-quality content in the online channel arena.

Personalized Information Premium Channels	**Internet Explorer 4.0**	**Netscape Constellation**
General Features – *Live Web Content available on demand*		
Standard Support for Channels	Channel Definition Format	No
Exclusive Premium Channels	Yes	Maybe
Channel content type supported	Any HTML, Dynamic HTML, Applets, ActiveX controls	Unknown
Offline viewing	Yes	Yes
Information Delivery Options (Webcasting)		
Live Channels	Yes	– Yes
Site Subscriptions	Yes	Unknown
Delivered to mailbox	Yes, possible with ***any*** HTML Web site	Limited to InBox Direct Content Providers
Mini channels (tickers, company phone directories, stock quotes, etc)	Yes	Yes

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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.

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

Integration between the Web and the PC

The Internet has clearly become a necessary component of everyone's lives. For many of us it has developed into 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 a proven user interface in 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 Menu and Taskbar get Web savvy*, and the *Active Desktop*.

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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.

True Web Integration Features Single Explorer	Internet Explorer 4.0	Netscape Constellation
Simple, Consistent Navigation		
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, available everywhere	Yes (including Explorer and Start Menu)	Partial (in browser and Constellation)
HTML viewing of file system	Yes	No
Native File Management	Yes	No
HTML-based Help	Yes	Yes

Start Menu and Taskbar Get Web Savvy

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 interfaee 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

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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. This comparison is between the new Start Menu and Taskbar functionality in IE 4.0 and the Activity Selector Bar, found in Constellation.

True Web Integration Features Start Menu & Taskbar	Internet Explorer 4.0	Netscape Constellation Activity Selector
Start Menu– *More control and customization from the Start menu & Taskbar*		
Launch Web icons	Yes	Yes
Contains your Favorite Web sites	Yes	Unknown
Contains History List	Yes	No
Drag/drop customization of all items (applications, favorites, etc)	Yes	Unknown
Taskbar and Toolbars		
Allows creation of multiple toolbars for launching files/apps/Web tasks	Yes	Yes, within Selector Bar
Switch natively between apps	Yes (Taskbar, etc.)	No
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	Netscape Constellation
Customizable Desktop – *Add rich Web content to your desktop*		
Web Components on the desktop	Yes (natively in the desktop)	Yes (Only in Constellation Homeport)
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

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True Web Integration Features Active Desktop	Internet Explorer 4.0	Netscape Constellation
Rearrange/resize desktop components to any position via drag/drop	Yes	Unknown
Displays the pre-existing content on users native OS desktop	Yes	No

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 organizations 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. On top of 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.[5] 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

[5] See http://www.microsoft.com/windows/zcrowp.htm for more detailed information on Microsoft's strategy for reducing the cost of owning PCs

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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.

Complete Administrative Features Central Administration	Internet Explorer Administration Kit	Netscape Administration Kit & AutoAdmin
Central Administration Features – IE 4.0 is designed to reduce your corporate cost of ownership		
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
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 easy 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.

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