

Piece Together Microsoft's Internet Puzzle

BY ROGER JENNINGS

Is Microsoft hard-core about the Internet? Take a look at the components of its Internet strategy, and judge for yourself.

Bill Gates proclaimed on Microsoft Internet Strategy Day, December 7, 1995, "We're hard-core about the Internet." If you want hard-core proof that Microsoft is devoting a major share of its development resources to Internet-enabling its entire product line, here's a list of the major components of the "Microsoft Internet Strategy" as of February 1996 when this article went to press. The list is organized by major product category. Available, announced, and rumored products appear alphabetically within each category.

SERVER-SIDE PRODUCTS

FrontPage is an easy-to-learn, commercial Web page authoring tool developed by Vermeer Technologies Inc., a company Microsoft acquired in January 1996. *FrontPage* consists of a client tool set for

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designing Web pages and server extensions to accommodate different operating systems, as well as *FrontPage*'s unique WebBots. A WebBot is an "active object" you drop on a page to implement interactive functions, such as Web-site registration, full-text searches, and discussion groups. WebBots replace Common Gateway Interface (CGI) scripts in HTTP-encoded pages, and the server extensions translate embedded WebBot statements back to CGI format.

Microsoft promises that the next version of the *FrontPage Developer Kit* will be enhanced with custom WebBots designed in Visual Basic or Visual C++. The current version of the developer kit lets you use Visual Basic and OLE Automation to customize Web Wizards, which automate page design and content generation. Technical specs and backgrounders for *FrontPage* are available at <http://www.microsoft.com/msoffice/frontpage/toc.htm>.

Microsoft Internet Information Server (MIIS), originally code-named Gibraltar, is the foundation of Microsoft's effort to make Windows NT Server the dominant player in the corporate Internet and enterprise intranet server market. Today, Unix workstations transmit the lion's share of Web pages, but MIIS's ease of installation, enhanced security, simplified administration, tight integration with Windows NT Server, and low hardware and software cost assure

MIIS a substantial edge over its Unix and Macintosh competitors. MIIS runs as a Windows NT service, and also provides CGI, Perl, Gopher, and FTP capability. Microsoft's recent agreement with MCI Communications Inc. (and MCI's SHL Systemhouse subsidiary) to adopt Windows NT Server and MIIS lends corporate credibility to Microsoft's entire Internet program (see "Serving up the Web," by Carl Franklin, in this issue for more on MIIS). An overview is available at <http://www.microsoft.com/intdev/server/IISOVW.HTM>.

Internet Server API (ISAPI) uses HTTP server filters to intercept embedded CGI scripts and redirect CGI calls through an IDispatch interface to in-process OLE DLLs or out-of-process automation servers that you write in VB4 or Visual C++ 4.0. Most Unix servers run CGI extensions in a separate fork, which usually involves more overhead than creating an instance of an OLE DLL. Use ISAPI and a middle-tier OLE DLL or

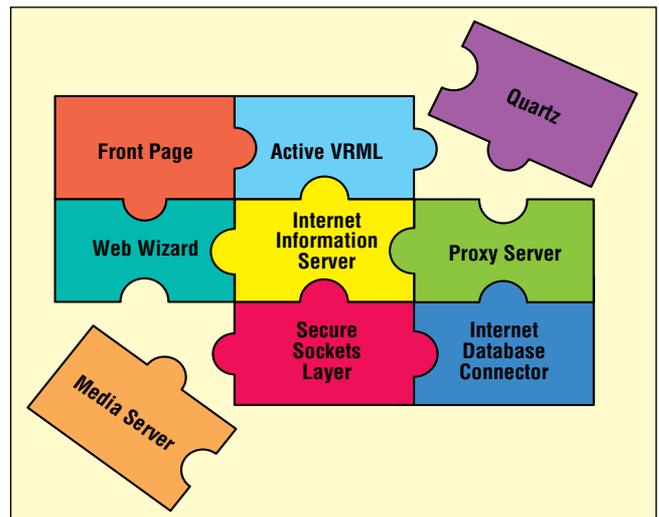


FIGURE 1 *The Puzzle Comes Together.* While some pieces (like *Media Server*) are vaporware, Microsoft's strategies for providing Internet application development tools are becoming clear. *MIIS*, the centerpiece, is available for free at <http://www.microsoft.com>.

automation server and the Jet 3.0 Data Access Object to bridge the gap between CGI queries and a variety of desktop databases, including Access MDB files. Get details at <http://www.microsoft.com/intdev/server/isapiapp.htm>.

Internet Database Connector (IDC, HTTPODBC.DLL) is an extension to the Internet Server API that lets Web pages query databases through function calls to the ODBC API. IDC uses PAGENAME.IDC files to define the ODBC data source and execute the SQL statement to a page defined by a PAGENAME.HTX template. IDC is specifically designed to link Internet Information Server to SQL Server 6.x, but can accommodate Select and action queries against any client/server database through a 32-bit ODBC 2 driver. Inclusion of IDC has resulted in the Microsoft Internet Information Server receiving high marks in recent reviews, but the per-seat or concurrent-user client license costs for intranet connections to Microsoft SQL Server were unresolved when this article went to press. A brief description of IDC appears at <http://www.microsoft.com/intdev/server/ISDATA.HTM>.

Internet Studio, called Blackbird in its initial implementation for The Microsoft Network, was to be Microsoft's high-end Web page authoring tool for Internet developers. In January, Microsoft apparently shelved Internet Studio in favor of its newly acquired FrontPage product line. The Microsoft Authoring Tools Web page, <http://www.microsoft.com/intdev/AUTOOLS.HTM>, offered this recommendation for those interested in Internet Studio: stay tuned.

Media Server stores MPEG-encoded video content for on-demand distribution. Media Server's intended market was Microsoft Interactive TV (MITV), a video-on-demand (VOD) service for cable TV operators and telephone companies planning high-speed fiberoptic or hybrid fiber/coax Asynchronous Transfer Mode (ATM) networks. Now that Internet service appears to have greater appeal to cable operators and phone companies, Microsoft is repositioning Media Server as an interactive video server for midband (ISDN) and wide-band (LAN, WAN, and cable modem) networking. Expect Media Server to play an important role in the implementation of Quartz's Media Processing Filters for video-enabled intranet and Internet applications.

NetworkOLE, slated for inclusion in the Windows NT 4.0 upgrade to the Windows 95 user interface later this year, is the "official" transport mechanism for Remote Automation Objects (RAOs) located on Windows NT Servers. NetworkOLE is critical to the implementation of SQL Server 6.5's distributed OLE Transaction mechanism that's likely to become a component of

Microsoft's Merchant Server for Internet commerce applications. NetworkOLE also plays an important role in Microsoft's Interactive TV system.

Proxy Server provides a secure isolation layer, or firewall, between corporate networks and the Internet. Catapult takes advantage of Windows NT Server's Multi-Protocol Routing and Routing Information Protocol (RIP) options, which let you connect LANs to WANs and vice versa without the need for a dedicated router. Microsoft's Proxy Server was in beta testing when this article was written and the only references to it appear in the Burton Group's analysis available from <http://www.microsoft.com/InfoServ/burton1.htm> and [burton2.htm](http://www.microsoft.com/InfoServ/burton2.htm).

Secure Sockets Layer (SSL) is a security system for bulk-encrypting data to provide secure communication over TCP/IP networks. Microsoft Internet Explorer 2.0 includes SSL security. The MIIS supports SSL and integrates the encrypted object-level and user-level access authorization services supplied by Windows NT Server's security model to provide authentication between the browser and the server.

SQL Server 6.5's *Web Wizard* creates HTTP-encoded documents from data retrieved by SQL queries. Web Wizard takes the mystery out of passing a huge number of parameters to a stored procedure that does the actual work of transforming data stored in SQL Server 6.5 tables to Web documents. SQL Server 6.5 was in the beta stage when this article was written and is expected to be released in mid-1996. A press release on SQL Server 6.5 appears at <http://www.microsoft.com/corpinform/press/1995/95dec/sqlatpr.htm>.

WEB BROWSER ENHANCEMENTS

ActiveVRML is a set of extensions to the Virtual Reality Modeling Language (VRML, pronounced "vermal") version 1.0 for creating static 3-D Web environments. Microsoft designed ActiveVRML to create interactive 3-D "worlds" with synchronized sound, motion, and video capabilities. Now that animation and real-time video are hot topics on the Internet, ActiveVRML, DirectX, and other game-related Windows 95 upgrades will be increasingly important to application developers. Details on ActiveVRML, which Microsoft proposes to incorporate in Internet-standard VRML 2.0, are found at <http://www.microsoft.com/intdev/inttech/avwhite.htm>.

DirectX consists of *DirectDraw* (graphics acceleration), *DirectSound* (digital audio mixing), *DirectPlay* (interactive modem gaming), *DirectInput* (for digital joysticks), *Direct3D* (accelerated 3-D graphics), and *DirectVideo* (Video for Windows accelerator) handlers. All but the Direct3D and DirectVideo products, which are available only through adapter card vendors, are

included in the Microsoft Game SDK. An overview is available at <http://www.microsoft.com/devnews/archive/gamesdk2.htm>. *DirectDraw*, which is the replacement for the Display Control Interface (DCI) support removed from Windows 95, requires hardware-specific drivers. *Direct3D* and *DirectVideo* need a high-speed graphics card with a *DirectDraw* driver. *Direct3D* is designed to support moderately priced 3-D graphics accelerator cards. An article on *DirectDraw*, *Direct3D*, and *DirectVideo* appears at <http://www.microsoft.com/windows/support/graphics.htm>.

OLE Controls 96 is a set of enhancements to OCXs that Microsoft says "include optimizations allowing objects and controls to stay inactive most of the time, drawing optimizations and enhancements, windowless OLE objects, and support for nonrectangular and transparent objects." The OLE Controls 96 upgrade is designed primarily to improve the performance and user interface of OLE controls embedded in Web browsers. Details on the OLE Controls 96 enhancements are published at <http://www.microsoft.com/intdev/inttech/ocx96.htm>.

OLE Scripting is Microsoft's mechanism for incorporating Visual Basic Script and scripts created in other interpreted programming languages, such as Java or JavaScript, within DocObjects. A script can be source code in text format, compiled pseudocode, or executable machine code. When a Web browser with OLE Scripting detects a script in a compound Web document, the browser initializes the script engine to process the script. The engine starts and captures events triggered by OLE controls or other control objects, and processes the events in accordance with the source code of the script. Get details from <http://www.microsoft.com/intdev/inttech/olescript.htm>.

Quartz is what Microsoft calls "an architecture for the processing of streams of multimedia data." According to Microsoft's "Creating Platforms for Innovative Internet Platforms" article (<http://www.microsoft.com/intdev/intover.htm>), Quartz uses "Filter Graphs" to handle new media types, such as streams of digitized video and audio. Expect Microsoft to open and mine the Quartz vein more deeply now that Netscape has acquired InSoft and its INTV!, CoolTalk, and CoolView products as the foundation for its LiveMedia add-on to future versions of Netscape Navigator.

Visual Basic Script (VB Script or VBS) is an "open Internet scripting language standard" to compete with Sun Microsystems' object-oriented Java and JavaScript programming languages. VBS is a lightweight subset of Visual Basic for Applications, but

it still offers most of the OLE Automation client capabilities of VBA. The primary application for VBS is to set property values and create customized event-handling subprocedures for OLE controls embedded in Web pages. VBS also can serve as a client of both in-process and out-of-process OLE Automation servers and connect with Java applets. When NetworkOLE becomes available, VBS is likely to be able to gain access to Remote Automation Objects (RAOs) stored on intranet servers to imple-

ment a variety of three-tier client/server processes. The major advantage of VBS over Java and its simplified spin-off, JavaScript, is that VB developers can leverage existing programming skills into the burgeoning Web page design marketplace. Microsoft plans to port VBS to the Macintosh and third parties promise to supply VBS runtime interpreters for several flavors of Unix. A summary of VBS appears at <http://www.microsoft.com/intdev/inttech/vbsintro.htm>.

Web Connector is a Microsoft Exchange gateway that lets users integrate real-time Exchange Server messaging with Web browsers. Web Connector automatically translates messages and other content in the Exchange Server's message store to HTML for display in the browser. The Web Connector is an extension of Exchange Server's Internet Mail Connector in Microsoft Exchange Server, which supports SMTP, UUENCODE, and MIME for Internet messaging. Web Connector is expected in late 1996. See the Burton Group's analysis of Microsoft's December 1995 Internet Strategy conference on <http://www.microsoft.com/backoffice/infoserv/default.htm>.

INTERNET-ENABLING OTHER CLIENT APPS

Document Objects (DocObjects) are the technology behind the Microsoft Binder application included in Office 95; both Word 7.0 and Excel 7.0 are DocObject servers. The advantage of DocObjects is that the server application, rather than the client, "owns" the frame within which the object appears.

This feature improves the handling of frame adornments, allows multiple views of documents, and aids in printing object content. The principal use of DocObjects is displaying objects created with Microsoft Office 95 applications and other DocObject-enabled applications, such as Visio 4.0, in Web pages. DocObjects are likely to appear in the next version of Microsoft's Internet Explorer. Get the lowdown on DocObject technology from <http://www.microsoft.com/intdev/inttech/docobj.htm>.

OLE Hyperlinks add key features of Internet navigation to existing applications. OLE Hyperlinks provide History, Favorites, Go Back, Go Forward, and Go Home functions and allow transparent retrieval of documents from LANs, WANs, intranets, and the Internet. OLE Hyperlinks provide navigation to locations within the current document, another document of the same class as the current document, or to a document of a different class. Details of new interfaces that implement OLE Hyperlinks are available at <http://www.microsoft.com/intdev/inttech/olehyper.htm>.

Sweeper (Programmability Model) is a set of three OLE Automation objects that provide OLE 2.x connectivity to Web browsers by implementing DocObjects on the client side. The HTML Object provides navigation methods for a single Web document. The IExplorerFrame object handles navigation between documents with Forward and Back methods. The Win96 Shell Folder Object integrates Web navigation in the Windows Explorer. Get details and code examples at <http://www.microsoft.com/intdev/inttech/sweeper.htm>.

WinInet is a distributable, 32-bit add-on Sweeper library (WININET.DLL) that provides operating system support for client-

side Internet functionality. WinNet will be incorporated in future versions of Windows 95 and Windows NT. The primary objective of the library is to eliminate the need to deal directly with TCP/IP, Internet protocols (such as FTP and HTTP), and Windows Sockets.

Many WinNet functions will replace a substantial amount of C programming required to implement routine tasks such as scheduled retrieval of files from an FTP server, or automatically gathering daily information from a set of Web pages. Shrinkwrapped-application programmers can use WinNet to integrate Internet functionality within their Windows productivity applications. Download the preliminary specification for WinNet at <http://www.microsoft.com/intdev/inttech/wininet.htm>.

Internet Control Pack is a set of OLE controls providing access to the WinNet functions for adding Web browsing, newsgroup reading, and FTP capabilities to applications created with VB4 and Access 95, plus other OLE 2.x client applications that can act as OLE control containers. Providing an OCX wrapper around the WinNet functions eliminates the need to declare function prototypes and takes care of callback problems. Updates to Microsoft Access and Visual FoxPro will provide easy Web access to data stored in Jet MDB and FoxPro DBF databases.

INTERNET SECURITY AND COMMERCE

Cryptographic API (CryptoAPI) is a set of functions that allow Windows applications to encrypt messages and provide digital signatures using public-key cryptography (PKC). CryptoAPI provides a framework for plug-in cryptographic service providers (CSPs), similar to the mechanism for MAPI and TAPI service providers. The Microsoft RSA Base Provider provides both North American and exportable versions and is included with CryptoAPI. CryptoAPI and CSPs play an important role in the forthcoming Merchant Server. The <http://www.microsoft.com/intdev/inttech/cryptapi.htm> page leads to further details.

Merchant Server, intended to compete with Netscape's Commerce Server, was not available when this article was written and is expected in late 1996. Merchant Server undoubtedly will include CryptoAPI, PCT, and STT to provide order capture and credit-card charge authorization for Internet commerce. References to Microsoft's Merchant Server appear in the Burton Group's analysis of Microsoft's Internet Strategy, at <http://www.microsoft.com/InfoServ/burton1.htm> and [burton2.htm](http://www.microsoft.com/InfoServ/burton2.htm).

Secure Transaction Technology (STT) is a protocol developed by Microsoft and Visa Corp. that handles secured credit-card payment over the Internet or any other insecure transport. STT uses DES encryption

for financial information, and direct RSA encryption of credit-card account numbers. It requires authentication of participants in the transaction.

The STT version available at <http://www.microsoft.com/intdev/inttech/wire15dx.htm> uses approved-for-export RC4 (40-bit) encryption. The Visa and MasterCard organizations were negotiating a common credit-card transaction protocol and wire format, called Secure Electronic Transactions (SET), so changes to

STT version 1.0 may happen in 1996.

Private Communication Technology (PCT), like SSL, is intended to prevent eavesdropping on communications between clients and servers, such as that between Internet Web browsers and servers. Server authentication is mandatory and client authentication is optional. Details are available at <http://www.microsoft.com/intdev/inttech/pct.htm>, and <http://pct.microsoft.com> provides links to Internet Draft versions of the two specifications. ☒