

# Novell's NetWare WEB SERVER

## An Easy Way to Stake Your Claim in Cyberspace

Roger Spicer and Laura Chappell

**T**he irresistible force of the World-Wide Web (WWW) has moved industry giants such as Novell, IBM, and Microsoft to reassess their strategies and reorganize their corporations. If the WWW can influence existing companies to change their product direction and prompt the creation of hundreds of startup companies, there can be little doubt that the WWW will affect everyone in the computer industry.

To help you take advantage of the Internet craze, Novell has released NetWare Web Server, a high-performance, full-featured WWW server that supports HyperText Transfer Protocol (HTTP). And because NetWare Web Server uses the familiar NetWare loadable module (NLM) architecture, you

won't have to learn a new operating system to stake your claim in cyberspace. You can install NetWare Web Server in only 10 minutes and build a fully functional WWW server in less than one hour. With NetWare Web Server, you can extend the functionality of NetWare, creating a powerful publishing, groupware, and communications resource for your company.

### SHOULD YOU BUILD A WWW SERVER?

Although building a WWW server is easy and thousands of companies are doing it, should your company even consider building one? What benefits can a WWW server offer?

By building a WWW server, you create a centralized source for delivering platform-independent, graphically rich





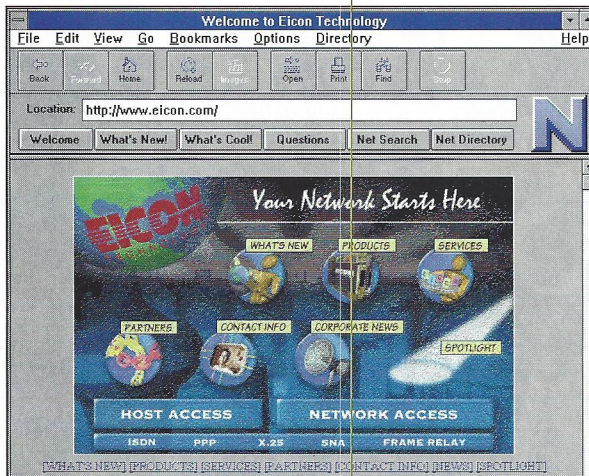


Figure 1. When we wanted information about ISDN, we visited Eicon Technology's home page.

information. You can post any information that your company has in electronic or printed format on a WWW server and receive the following benefits:

### Updated Information

You can update information instantly. Unlike standard documents stored on a

network file server, WWW documents generally consist of many smaller HyperText Markup Language (HTML) documents that are connected by hypertext links. Rather than having to edit a large standard document, you can edit one small HTML document without affecting the other HTML documents that are linked to it.

You can also link HTML documents to files created by database applications. Then when you make a change to the corporate database, that change is instantly reflected

in the linked HTML documents. As a result, you do not have to individually edit every HTML document containing that information.

### Reduced Costs

You can reduce the costs of reproducing and distributing information.

Because up-to-the-minute information is readily available on a WWW server, you may not need to distribute as many printed documents. For example, when you release a new product, your customers can immediately get information about that product on your WWW server. They do not have to wait for you to print a product brochure and mail it to them.

### Increased Productivity

You can increase productivity by making information readily available to all users, regardless of their hardware platform or operating system. All HTML documents are accessible from a PC, Macintosh, or UNIX workstation. You do not have to modify the documents in any way to accommodate various hardware platforms or operating systems since all WWW browsers recognize the same HTML codes.

In addition, many WWW browsers support snap-in modules for various applications. For example, you can integrate the Adobe Acrobat reader with Netscape Navigator. Then when you click a hypertext link to an Acrobat document, Netscape Navigator will automatically launch the Acrobat reader and display the document in its correct format. Although support for this type of access is limited to specific browsers and hardware platforms, you can expect this capability to become pervasive in the near future.

The following examples illustrate how your company can use a WWW server to effectively distribute information.

### A WWW Server for the Human Resources Department

You can build a WWW server for the human resources department to help your company save time and distribute information more efficiently to its employees. This WWW server could host information such as company policies and procedures, insurance policies and other benefit programs, and current job openings. If you implement the proper security, you can even link the WWW server to the corporate database so that employees can check on the amount of sick time and vacation time they have accrued. You can also enhance corporate communications and improve security by linking employees' names to their picture IDs, which are stored as .GIF files.

## SFLOGIN. The solution.

**SFLOGIN is designed to simplify the NetWare Login Process – now any user can login with ease and speed from any branch of your tree.**

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- Searches NDS to locate specified user objects (wildcards supported);
- Provides a customizable full screen interface (optional SVGA graphics);
- Has enhanced client security;
- Incorporates an integrated full screen NDS browser.

**Additional features include:**

- Versions available for DOS and Windows;
- Supports NDS and Bindery services;
- Has optional offline NDS indexing and searching;
- Language enabled for international use;
- Simple and inexpensive licensing.

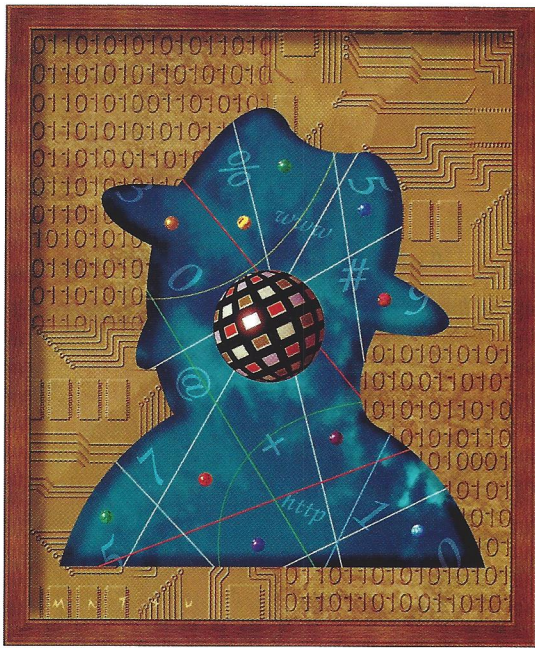
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**Example Only: Login with SFLOGIN**

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Developer tested only Novell makes no warranty with respect to this product





In addition, you can promote teamwork within your company by encouraging users to create a personal home page that advertises their job responsibilities. For some examples of personal home pages, you can visit <http://www.geocities.com>. (You might even see an old family picture of one of the authors at <http://www.geocities.com/WestHollywood/1917/realindex.html>.)

### A WWW Server for Product Information

You can build a WWW server that provides customers with product photographs and information, including specifications, installation requirements, and prices. Customers could fill out forms that link to a database for automatic information mailings, product orders, or sales follow-up. For example, we needed information about setting up an Integrated Services Digital Network (ISDN) connection to the Internet, so we visited Eicon Technology's home page at <http://www.eicon.com>. (See Figure 1 on p. 8.) We discovered that Eicon Technology offers several ISDN products. We downloaded the data sheets for these products and selected the ones that best suited our needs.

### A WWW Server for Threaded Discussions

You can build a WWW server that allows users to exchange ideas and information online through threaded discussions. Users can start a threaded

discussion by posting a new message, or they can continue a threaded discussion by responding to an existing message. These messages are logically connected, so you can click and read each message in a thread.

Threaded discussions can help you manage workflow, encourage brainstorming, obtain consensus, and simplify troubleshooting. For example, NetWare Users International (NUI) has set up six technical discussion forums for NetWare users on the WWW. You can post a technical question and receive an answer from Mickey Applebaum or Jim Henderson, the forum leaders. If you need more information, you can then respond to the forum leader's message. You can access NUI's technical discussion forums at <http://www.nwconnection.com>.

You can also use threaded discussions to set up a rumor information center (to stop, not start, rumors), an online suggestion box, or an area in which people can "meet" corporate executives online. If your company wants to control content, you can purchase software that allows you to delay posting messages. This way, you can edit messages before they are posted.

### DO YOU NEED AN INTRANET OR AN INTERNET SERVER?

There are two types of WWW servers: intranet and Internet. An intranet server is available only to your own company via a LAN or WAN connection. An Internet server, on the other hand, is available to the public through the Internet. In the examples above, the WWW server for the human resources department is an intranet server; Eicon Technology's WWW server is an Internet server.

Once you decide whether to set up an intranet server or an Internet server, you can design your home page and determine what information you will put on the server. Keep in mind that you will be limited by the bandwidth of the connection (whether it is a LAN, WAN, or modem connection) and the capabilities of the client software. Because a LAN connection offers more bandwidth than a modem connection (compare 10Mbit/s to 28.8kbit/s), you can generally use larger files and more graphics on intranet servers. (Figure 2 on p. 14 explains some

key differences between an intranet server and an Internet server.)

If you set up an intranet server, you can dictate page design by creating corporate design standards, and you can control how employees view content by ensuring that everyone is using the same browser. If you set up an Internet server, however, you cannot control how visitors view your WWW site. Internet surfers use a variety of browsers, some of which may not display your site's content favorably. The WWW itself is a good source for tips on content and page design. For example, the HTML Lab (<http://www.neca.com/qvctc/other/htmlab.htm>) contains hypertext links to several HTML reference documents and tools.

### WHY CHOOSE NETWARE WEB SERVER?

Now that you have decided to set up a WWW server, you must determine what software will best meet the needs of your company. NetWare Web Server 2.5, which is scheduled for release in June, offers several significant advantages over other WWW server products. The benefits listed below just might convince you that NetWare Web Server can provide a viable intranet or Internet platform for your company.

#### Performance

The main function of a WWW server is to serve up files for browser clients. As the recognized leader in file server technology, Novell built NetWare Web Server to meet the demands of a WWW environment. In March, Shiloh Consulting and Haynes & Company tested Microsoft Internet Information Server 1.0, Netscape Communications Server 1.12 for Windows NT, and NetWare Web Server 2.5. The tests were based on the Web Stone release version 1.1 server benchmark, which is recognized as the industry standard for measuring WWW server performance. When serving 128 clients, NetWare Web Server's throughput was 16 percent greater than Microsoft's WWW server and almost four times greater than Netscape's WWW server. Go to <http://www.nwconnection.com>, click the Current Issue button, and select WWW Server Performance Tests to view these test results.

#### Scalability and Reliability

If you are running NetWare 4.1 SMP, NetWare Web Server 2.5 can take advantage of the extra processing power to scale



for high-demand environments, such as that of an Internet service provider (ISP). You can also increase the reliability and availability of your WWW server by running NetWare Web Server on NetWare SFT III.

### Familiar NetWare Environment

NetWare Web Server installs as a set of NLMs in only 10 minutes. You can manage and monitor NetWare Web Server with familiar NetWare tools such as the MONITOR utility or the Manage-Wise management platform. NetWare Web Server also allows users to access information in NetWare Directory Services (NDS), such as usernames, e-mail addresses, Internet addresses, applications, and other network resources.

As a bonus, Novell's longtime partner Compaq Computer, Inc., is bundling NetWare Web Server with all of its Compaq servers purchased between February 1 and July 31, 1996. Compaq is also integrating NetWare Web Server with its own SmartStart installation process, which offers easy installation and performance-tuning capabilities.

### Easy Setup

With NetWare Web Server, you can set up an intranet server quickly and easily. (See "Setting Up NetWare Web Server Step by Step" on p. 12.) By installing NetWare MultiProtocol Router (MPR) with NetWare Web Server and linking it to the Internet, you can transform your intranet server into an Internet server.

### Management Tools and Programming Interfaces

NetWare Web Server provides an easy-to-use management utility, error logging, access logging, and programming interfaces. Using the NetWare Web Server Administration (WebAdmin) utility, you can configure, organize, and monitor your WWW server. For example, you can specify where users' home pages will reside on the server.

When you load NetWare Web Server, the HTTP Server Information screen displays information about the server, such as how long the server has been up, the total number of requests the server has received, and the number of errors. Two log files are created: ERROR.LOG displays system error information such as incorrect passwords or attempts to access nonexistent files. ACCESS.LOG shows

all of the transactions from each client, such as which HTML documents were accessed and what applications were run.

NetWare Web Server provides an interpreter for PERL, the most common programming language for WWW servers, and a BASIC interpreter for BASIC programmers. NetWare Web Server also includes the Local Common Gateway Interface (L-CGI), which is streams-based and must run on the same

server, and Remote CGI (R-CGI), which is sockets-based and can run on the same server, on a remote server, or on another TCP/IP host such as a UNIX server.

You can use both L-CGI and R-CGI to make your WWW pages more interactive. Using R-CGI, you can offload database and transaction processing to other network servers, creating dynamic WWW pages. For example, you can use R-CGI to post a form for users to

**uh oh**

**...and you better make sure all backups include email, databases & web servers. I don't care if the files are open. Deal with it!**

**whew**

(the boss)

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## Setting Up NetWare Web Server Step by Step

You may not believe that installing and configuring NetWare Web Server is a simple, straightforward process. However, the example below will prove that we are not exaggerating. We have included all of the steps we followed to set up an intranet server for our company using NetWare Web Server 2.0 (the shipping version when we tested this product).

### STEP 1: CONFIGURE THE SERVER HARDWARE

NetWare Web Server requires an Intel-based server running NetWare 4.1. This server must have at least 16MB of RAM and 6MB of disk space to accommodate the NetWare Web Server software. However, because we are also storing HTML documents on the server, we needed an additional 100MB of disk space.

Your network must also be running IP. If IP is not installed on your network clients, you must install an IP-IPX gateway somewhere on your network. We loaded the TCPIP NetWare loadable module (NLM) on our server. (If you are using TCPIPNLM, applying the latest patch will improve performance. You can download this patch from <ftp://ftp.novell.com/pub/updates/unixconn/tcpip2x/tcp188.exe>.)

You also need a network interface board, which you must configure. Since our server supports traditional NetWare file-and-print services, we bound IPX to our NE2000 board. We also bound the TCP/IP stack to the NE2000 board so that our clients can communicate with the WWW server using TCP/IP. We then configured the board with the following addresses:

Logical LAN board #1: NE2000, Int 3, Port 300 name=ipx  
address=CD-CD-CD-CD

Logical LAN board #2: NE2000, Int 3, Port 300 name=ip  
address=152.67.38.101 netmask=255.255.0.0

### STEP 2: INSTALL THE NETWARE WEB SERVER SOFTWARE

We used Novell's PINSTALL utility to install the NetWare Web Server software. During the installation process, we were prompted for a NetWare Web Server administrator password. The NetWare Web Server administrator has rights only to the WWW server, not to the rest of your network. As a result, you can use the NetWare Web Server administrator object to set up a Webmaster who will manage only your WWW server.

PIINSTALL creates the following directories:

\\WEB	
\\CONFIG	[NetWare Web Server configuration files]
\\DOCS	[root of HTML documents, images, icons, and so on]
\\LOGS	[log files]
\\MAPS	[image map files]
\\SAMPLES	[sample L-CGI and R-CGI files]
\\SCRIPTS	[BASIC R-CGI script files]
\\SCRIPTS\\PERL	[PERL R-CGI script files]

*Note.* The root of NetWare Web Server is SYS:WEB; users cannot see other areas of the volume.

### STEP 3: LAUNCH THE NETWARE WEB SERVER SOFTWARE

Restart NetWare Web Server. The following NLMs are automatically loaded through the UNISTART.NCF file:

- NETDB.NLM. This NLM provides network database access for IP address information, including the Internet Domain Naming System (DNS) if it is installed.
- BASIC.NLM. This NLM is the BASIC language interpreter.
- PERL.NLM. This NLM is the PERL language interpreter.
- HTTP.NLM. This NLM provides HyperText Transfer Protocol (HTTP) support for NetWare Web Server.

NetWare Web Server also includes CGIAPP.NLM, which is not loaded by the UNISTART.NCF file. You should load this optional NLM if you use Common Gateway Interface (CGI) applications.

*Note.* Since NetWare Web Server may be required to handle a large number of I/O requests, you should set the maximum packet receive buffers up to 1000. (Use the INSTALL or INETCFG utility to add the following line to your STARTUP.NCF file: SET MAXIMUM PACKET RECEIVE BUFFERS=1000.)

### STEP 4: SET UP NETWARE WEB SERVER SECURITY

By default, NetWare Web Server's root directory is SYS:WEB. Users can explore only areas below the root directory unless they are granted rights to other NetWare Web Server directories. (This is a basic NetWare Web Server security feature.) You can change the location of the root directory using the following command:

```
LOAD HTTP.NLM -D path
```

Replace *path* with the root directory's new location.

You can use NetWare Web Server's default security (all users can access only the directories that reside below the root directory), or you can restrict access to specific directories. To change the default settings, you must use the NetWare Web Server Administration (WebAdmin) utility, which runs on a Windows 3.1, Windows for Workgroups 3.11, Windows 95, or Windows NT workstation. This workstation needs at least 8MB of RAM; 1MB of free disk space; the NetWare DOS Requester (virtual loadable module, or VLM, client), the NetWare Client 32 for DOS/Windows, or the NetWare Client 32 for Windows 95; IPX; and a WinSock 1.1-compliant TCP/IP stack. We loaded the WebAdmin utility on our LAN WorkPlace 5 client workstation. (LAN WorkPlace Pro for Windows 95/NT is scheduled for release in July. See "A Sneak Peek at LAN WorkPlace Pro for Windows 95/NT" on p. 18.)

Eventually, we may want to create a new directory (for example, SYS:CORPINFO) that contains confidential corporate information, and we can use the WebAdmin utility to ensure that only authorized users in our company can access that directory. If we decide to put our WWW server on the Internet, we can again use the WebAdmin utility to grant specific users, whether they are inside or outside the company, access to that directory. For example, we can grant all users with the IP address 137.10.x.x access to the SYS:CORPINFO directory. For now, however, NetWare Web Server's default security meets our company's needs.

### STEP 5: CREATE A HOME PAGE

We didn't want to create an elaborate home page for our intranet server. Instead, we wanted the server to display a list of available HTML documents.

To enable our intranet server to display a directory listing, we launched the WebAdmin utility and checked Enable Indexing under the Directories tab. We selected all three available options:



- **Fancy Indexing.** This option ensures that NetWare Web Server generates entries that show icons, file sizes, and filenames. Fancy Indexing requires significant processing power and may decrease the WWW server's performance.
- **Icons Are Links.** This option ensures that the icons representing each HTML document are active hypertext links that point directly to each document's Internet address.

- **Scan Titles.** This option enables the automatic directory indexing feature. NetWare Web Server then scans the HTML documents on the WWW server for titles and generates a description of each file.

We renamed NetWare Web Server's default home page INDEX.HTM in the DOCS directory to make sure that NetWare Web Server displays our directory

listing when a user points to the intranet server's address.

#### STEP 6: TEST NETWARE WEB SERVER

From Netscape Navigator, we entered our intranet server's address, <http://152.67.38.101>. We then copied our company's HTML documents into the DOCS directory. As a result, these documents will automatically be displayed in the directory listing when users access our home page. ●

complete. The information they input can then be sent to your corporate database. You can also automatically update your WWW pages from information residing in a database.

In addition to these management tools and programming interfaces, NetWare Web Server includes a single-user license for Netscape Navigator 2.0.

#### ACCESS CONTROL

With NetWare Web Server, you can control access to your WWW server by authenticating users in your company through NDS. You can even control who can access your WWW server from outside your company. You can grant access through a specific IP address, a network IP address, a user, a group, a directory, or a document.

#### NDS Integration

One of the most compelling reasons to use NetWare Web Server is its tight integration with NDS and the future enhancements that will leverage both NDS and Novell's Internet strategy. Several sessions at BrainShare '96, Novell's annual technical conference, demonstrated how to extend the NDS schema to include WWW pages. For example, you could make HTML documents objects in the NDS tree and place all of the HTML documents for the human resources department in the HR organizational unit (OU). Then users could browse the NDS tree to view all available HR HTML documents. As companies post large amounts of information on the WWW, NDS will help organize it and provide a useful way to manage, locate, and track WWW pages.

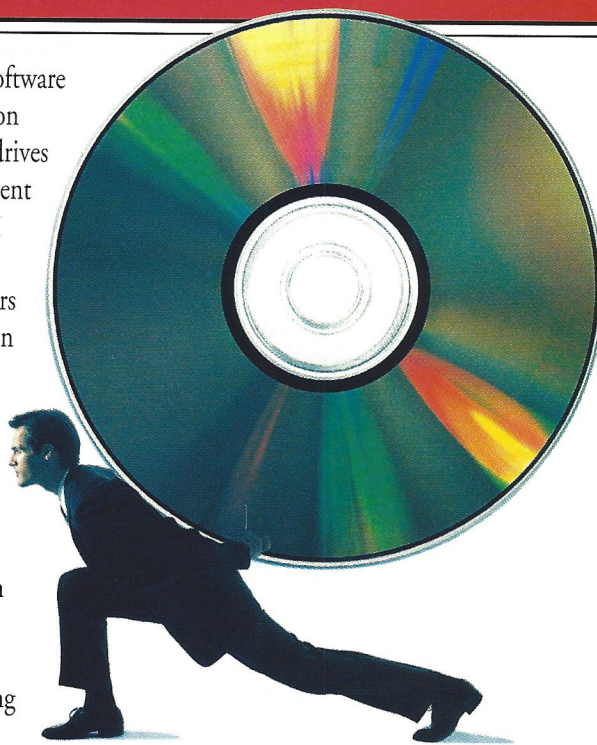
#### Java Integration

Novell was the first company to obtain a full license for Java from Sun Microsystems, Inc. By embedding Java into the NetWare operating system,

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Issues	Internet	Intranet
<b>Graphics</b>	Make graphics as small as possible and with as few colors as possible. Generally, two- to three-inch, 16-color graphics are preferred. The .GIF graphic format offers smaller file sizes, but only browsers supporting that format can view .GIF files. If possible, give users the option of viewing text only.	You can experiment with graphics on your LAN to see what level of performance and quality is acceptable. At a minimum, you should be able to support quarter-screen, 256-color graphics. Avoid placing large graphics on your home page to allow quick access to other material.
<b>HTML Pages</b>	Pages should be short (a single screen if possible). Create several small, modular pages that are connected by hypertext links rather than one long page.	Pages can be longer because you can download them more quickly over a LAN connection. However, modular pages are still beneficial for updating information.
<b>Browsers</b>	Some features, such as tables, are only supported in later versions of browsers. You may want to stay behind the cutting edge of Internet technology to provide access to the widest range of users. One option is to supply the latest browser technology to users who visit your site. For example, many sites that contain tables provide a hypertext link to Netscape's Internet site, where users can download the latest version of Netscape Navigator.	You can set up procedures to provide the latest browser technology to users in your company. For example, users can click a hypertext link to download the latest version of a particular browser. In this way, they can immediately take advantage of new features.
<b>Snap-in Modules</b>	With a hypertext link, you can offer users snap-in modules that are free or under license to your company. However, you should consider whether requiring users to download a snap-in module to view your site would deter them from visiting it. Also, if you rely on another site to supply software, that site may be unavailable at times (because it is busy or the server is down) or may be subject to changing policies. For example, if the snap-in module is beta software, it could be removed from the site as a free download when it is released as a retail product.	You can easily distribute snap-in modules to users in your company. For example, you can distribute viewers for applications that meet your corporate standards so users can view existing presentations or documents online without modification.

**Figure 2.** The type of WWW server you install will affect the design of your home page and determine the types of files users can download.

Novell can provide the functionality of Java to its third-party software developers, who can then create Java applications that run on NetWare. A Java-enabled browser (such as Netscape Navigator) would be able to run Java applets directly from the NetWare server.

Novell has also announced its intention to port all of the standard NetWare utilities to Java. As a result, NetWare utilities such as FILER or SALVAGE will immediately become platform-independent. A Java-enabled browser running on UNIX, Macintosh, OS/2, or Amiga would be able to run the Java NetWare utilities just as any DOS/Windows workstation does today.

### SECURITY ISSUES

If you decide to set up an intranet or Internet server, one of your main concerns will be security. You must decide how much money, convenience, and

performance you are willing to trade to provide the security you need.

Your primary defense for sensitive data will probably be the security features built into NetWare 4.1, with which you are already familiar. NetWare Web Server complements standard NetWare security with three additional features:

#### WWW Server Administrator and Password

When you install NetWare Web Server, it creates an ADMIN user with rights only to the WWW server. This feature allows you to delegate Webmaster duties to another user, while ensuring that this user has the Supervisor right only to the WWW server. (You should make sure this user has a unique password.) You do not have to grant this user access to other parts of your network.

When you set up NetWare Web Server, you should assign users a different

password to access the WWW server than they use to access the NetWare network. When a NetWare user logs in to the network, his or her password is securely encrypted. When an Internet user accesses any WWW server, however, the password may be encoded, but it must travel through hundreds of computers before it reaches its destination. Anyone with the appropriate knowledge and necessary tools can capture information off the wire and decode it. Because the Internet is not centrally owned and maintained, there is no way to prevent information from being intercepted. If a user has the same password for the WWW server and the NetWare server, an intruder may be able to decode the WWW password and access the NetWare network.

#### Directory Access

In addition to configuring options such as the server name, the location of HTML



Firewall Component	Typical Implementation
Screening Router	The screening router is a basic component of most firewalls. For example, NetWare MultiProtocol Router (MPR) can filter TCP/IP traffic and restrict access so that only authorized nodes or network IP addresses can access your private network.
Bastion Host	A bastion host is generally a system identified by the network administrator as a critical point in the network's security. If you use filtering or secured connections so that only a single system is visible to the Internet, you should pay special attention to that system's security by performing regular audits and installing special software to enhance security.
Dual-Homed Gateway	To create a dual-homed gateway, you attach a system both to the Internet and to your private network, but you disable TCP/IP forwarding. This gateway is accessible from both the Internet and your private network, but no traffic is sent between the two networks. If your users require Internet access, use a configuration that allows only outgoing calls. For example, you could configure NetWare MPR with asynchronous or ISDN dial-out capabilities. A dual-homed gateway should always be considered a bastion host.
Screened-Host Gateway	A screened-host gateway is a combination of a bastion host and a screening router. The bastion host sits on your private network, and the screening router is configured so that the bastion host is the only system visible to the Internet. You can enhance this setup by configuring the screening router to block traffic to the bastion host on certain ports so that only a few services are available. Blocking Telnet access, for example, could thwart potential intruders.
Screened Subnet	To set up a screened subnet, you create an isolated subnet between the Internet and your private network. This subnet screens routers between the Internet and the subnet and between the subnet and your private network. Both the Internet and your private network have access to the subnet, but traffic across the subnet is blocked. Two NetWare MPRs could effectively provide this type of security configuration.
Application-Level Gateway	Also known as a proxy server, an application-level gateway provides Internet access to people on closed subnets. All communications sent to the Internet from your private network originate from the application-level server's address rather than from the individual clients' addresses. You would usually require users to be authenticated to the application-level server and limit Internet access to specific applications such as HyperText Transfer Protocol (HTTP), FTP, and Gopher.
Hybrid Gateway	A hybrid gateway uses everything from protocol tunneling to traffic analysis to thwart potential intruders. The AT&T corporate firewall consists of a hybrid gateway and a bastion host.

**Figure 3.** If you set up a WWW server, you may want to investigate the different types of security firewalls and build one for your company.

documents, and the administrator's e-mail address, you can use the WebAdmin utility to specify which directories users can access. You can grant everyone Read-only access or define exactly which users can access a specific directory. However, keep in mind that you can restrict directory access through NDS only for users in your company. To control what users outside your company can access, you must use the System Access option.

### System Access

Using the WebAdmin utility, you can grant access to server resources based on an IP address or an Internet domain. You specify the directory name and an IP address or a domain name. By using only the network portion of the IP address, you can grant access to all workstations

that use that network address as part of their IP address. As a result, you can use this option to grant access to business partners while restricting other people from accessing your server.

### Firewalls

If you make some of your network resources available on the WWW and you grant rights to the user Guest or to the group Everyone, all Internet users will have some rights on your system. If you want to protect your system from this kind of accessibility, you should set up a firewall, which is simply a computer with software designed to prevent unauthorized access to your private network. For example, you could use a combination of NetWare 4.1, NetWare Web Server, and NetWare MPR to set up a high level of

security. Because NetWare MPR filters IP and NetWare communications, it can effectively hide your internal network from the Internet and act as a firewall. We cannot explain the nuts and bolts of building a firewall in this article, but Figure 3 defines the components you can use to create a firewall.

Although building a firewall can be complicated, don't despair: Your ISP can help you. For example, AT&T provides screening router services and supports NetWare encryption technologies. Many ISPs will host (maintain at their site) your Internet server, allowing you to keep confidential information behind a firewall supplied and maintained by your ISP.

You can also read one of the many books written about this subject, such as *Firewalls and Network Security* by William



### A Sneak Peek at LAN WorkPlace Pro for Windows 95/NT

Novell recently announced LAN WorkPlace Pro for Windows 95/NT, which is a set of 32-bit, WinSock-compliant TCP/IP applications for networked and standalone computers running Windows 95 or Windows NT. These applications allow users to access their company's intranet or the Internet, and they are designed to operate on both Microsoft's and Novell's 32-bit TCP/IP stacks.

LAN WorkPlace Pro for Windows 95/NT, which is scheduled for release in July, offers the following features:

- The Windows 95- or Windows NT-aware installation takes advantage of the Windows 95 or Windows NT registry, which means that the LAN WorkPlace Pro TCP/IP setup is automatically recognized by Windows 95 or Windows NT.
- The Dynamic Host Configuration Protocol (DHCP) Server NetWare loadable module (NLM), which is bundled with LAN WorkPlace Pro for Windows 95/NT, provides centralized TCP/IP address management.
- You can install LAN WorkPlace Pro for Windows 95/NT on either the client or the server. If you install it on the server, clients can share access to the 32-bit TCP/IP applications on the server.

In addition to providing these features, LAN WorkPlace Pro for Windows 95/NT is unique in what it does not provide: Because you do not need to load NetWare client software, a TCP/IP stack, a dialer, and DOS utilities on the machine that runs LAN WorkPlace Pro for Windows 95/NT, they are not included with the product. Both Windows 95 and Windows NT come with a TCP/IP stack, a dialer, and their own utilities. LAN WorkPlace Pro for Windows 95/NT is designed to use your existing TCP/IP configuration, the Windows dialer, and the Windows utilities. As a result, you do not have to install and configure additional software.

#### 32-BIT TCP/IP APPLICATIONS

LAN WorkPlace Pro for Windows 95/NT includes the following 32-bit TCP/IP applications:

- DHCP Server, which provides IP address management by dynamically assigning IP addresses as they are needed
- Finger, which gathers information about a user (such as the user's home directory and login name) on a remote system

- Finger Server, which initiates a process that responds to a Finger request
- Host Presenter, which provides terminal emulation so you can run single or multiple sessions on remote UNIX hosts
- IP Resolver, which associates host names and IP addresses (You can input one and get the other.)
- Line Printer Daemon (LPD), which allows you to print on a remote UNIX system
- Line PRinter (LPR) client, which sends print jobs to LPD
- Rapid Filer, which enables you to transfer files to your system from remote FTP systems
- Serving FTP, which responds to an FTP request from a user on a remote system and provides that user with a single FTP session to transfer files from your system
- Talk, which displays a split screen that enables you to exchange messages with a user on a remote system
- Trivial FTP, which performs the same function as FTP but uses a different protocol (User Datagram Protocol, or UDP, instead of TCP) that has less overhead because it does not provide guaranteed delivery

LAN WorkPlace Pro for Windows 95/NT also includes a TN3270 terminal-emulation program, an NFS client, a program that allows you to run X-Server applications on remote systems, and a single-user license of Netscape Navigator 2.0.

#### SYSTEM REQUIREMENTS

The minimum requirements for a LAN WorkPlace for Windows 95 client include a 386DX or higher processor, 8MB of RAM, a VGA or higher resolution monitor, and 28 to 32MB of hard disk space. A LAN WorkPlace for Windows NT client needs at least a 386DX or higher processor (a Pentium processor is recommended), 12MB of RAM, a VGA or higher resolution monitor, and 28 to 32MB of hard disk space.

One of the most compelling reasons to upgrade to LAN WorkPlace Pro for Windows 95/NT is its improved performance over LAN WorkPlace 5, its 16-bit predecessor. Later this year, LAN WorkPlace Pro for Windows 95/NT should be available in Japanese, French, German, Spanish, Korean, Chinese, Dutch, and Italian.

For more information about LAN WorkPlace Pro for Windows 95/NT, call 1-800-NETWARE or 1-801-429-5588. You can also visit Novell's WWW site (<http://www.novell.com>). ●

R. Cheswick and Steven M. Bellovin (Addison-Wesley Professional Computing Series) and *Building Internet Firewalls* by D. Brent Chapman and Elizabeth Zwicky (O'Reilly & Associates).

#### NOVELL INNERWEB PUBLISHER

In response to users' requests for a complete intranet solution, Novell has announced the Novell InnerWeb Publisher. This suite of products makes it easier for companies to take advantage of the WWW; it includes all of the tools they need to set up an intranet server. In addition to NetWare Web Server 2.5, Novell InnerWeb Publisher includes the following products:

- Netscape Navigator 2.01 (50-user license)
- SoftQuad HoTMetaL Light, which enables you to create HTML documents
- Quarterdeck IWare Lite, which allows you to access the WWW via IPX
- NetWare 4.1 Runtime, which enables you to implement NetWare Web Server on a dedicated runtime server in a NetWare 3 or 4 environment

Like NetWare Web Server 2.5, Novell InnerWeb Publisher is scheduled for release in June. For more information, call 1-800-NETWARE or 1-801-429-5588 or visit Novell's WWW site (<http://www.novell.com>).

#### CONCLUSION

The rapid development of WWW technology is changing the way we work and placing new demands on computer support personnel—especially network administrators. Taking advantage of NetWare Web Server's familiar environment may be a quick and easy way to set up an intranet server or to get your company on the Internet. You can extend both your network's capabilities and your own expertise into new areas.

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