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What's New in NetWare 5.1: The Complete Solution for Web-Based Networking

The new version of NetWare 5 is here, and it's packed full of features and technologies that will bring your organization into the whiz-bang world of Web-based networking and collaboration.

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Introduction

NetWare 5.1 is much more than just the next version of NetWare. It is a complete solution for creating corporate Web sites or intranets. With its open-standards Web application and development tools, NetWare 5.1 is a complete platform for deploying mission-critical e-business applications.

NetWare 5.1 builds on the success of NetWare 5 to provide a stable and secure server for Internet-enabled businesses. NetWare 5.1 turns a server-class computer into a high-performance Internet server, providing connectivity not only among personal computers, printers, and mass storage devices, but also through the Internet and company intranets and extranets.

This AppNote takes a look at the new features included in NetWare 5.1 and describes how these features offer improved benefits in terms of network administration, end user capabilities, Web services, and application and e-business solutions. It also discusses the installation requirements for moving to NetWare 5.1.

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For the latest information on NetWare 5.1, refer to the product Web site at:

http://www.novell.com/netware5

New Features in NetWare 5.1

NetWare 5.1 is a complete product with many tools, utilities, and solutions. It provides not only a platform, but also an entire infrastructure, upon which companies can build powerful networks. Solutions based on NetWare 5.1 can range from simple to complex, providing everything from very basic networking services to complete Web-based applications.

In addition to the NetWare operating system and an updated version 7 of Novell Directory Services (NDS), NetWare 5.1 offers the following new features from Novell and third parties:

- NDS eDirectory (formerly known as NDS 8)
- NetWare Management Portal
- NetWare Web Manager
- NetWare Enterprise Web Server
- NetWare Web Search Server
- NetWare FTP Server
- NetWare News Server
- NetWare MultiMedia Server
- IBM WebSphere (an application server framework for deploying cross-platform applications)
- Oracle 8i (five-user license)
- Support for networked features of Office 2000 (such as Web folders and the Web Distributed Authoring and Versioning-or WebDAV-standard for file usage on the Internet)
- Halcyon InstantASP
- Novell's Java Virtual Machine (JVM) for NetWare

These new features elevate NetWare 5.1 to an even more powerful server than NetWare 5.0. With the Web tools included with NetWare 5.1 you can create a full-featured, Web-based network server capable of hosting, creating, publishing, and finding your Web-based information.

The remainder of this AppNote looks at these new features and briefly explains the benefits offered by each one. The features are grouped into those for network administrators, end users, Web services, and applications and e-business tools.

NetWare 5.1 Administrator Benefits

With all the new features, tools, and utilities included in NetWare 5.1, a network administrator can create a

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Web solution that services all levels of the company. Additional Web-based management tools are also included: NetWare Deployment Manager, NetWare Management Portal, NetWare Web Manager, and ZENworks Starter Pack. Following is a brief look at each of these tools and their features.

NetWare Deployment Manager

To clear some of the barriers that have kept some companies from moving to NetWare 5 and upgrading NDS versions, NetWare 5.1 includes a new NetWare Deployment Manager tool that makes all the preparations for you and guides you through the installation/upgrade process. Deployment Manager can help you migrate to NDS version 7 if your tree is ready, and warn you if it's not. It also contains information about what will be necessary to prepare for an upgrade to NDS eDirectory (NDS 8).

NetWare Management Portal

The NetWare Management Portal is a Web-based management utility that provides complete management of NetWare 5.1 servers and partial management of NetWare 4.x and 5.0 servers that are in the same tree as your NetWare 5.1 server. The Management Portal (or "Portal" for short) is run through a Web browser on a client workstation and allows you to manage your server from any location on your network where a Web browser is available. Portal allows servers that don't support TCP/IP to be seamlessly integrated in your corporate intranet.

NetWare Management Portal allows network administrators to view the status and health of the server processes, resources, NLMs, and even hardware devices. It also allows you to:

- Mount and dismount volumes
- Access files on volumes and DOS partitions
- Manage server connections
- Configure SET parameters
- Monitor system resources
- View server console screens
- Browse the NDS tree and view NDS partitions
- Down or restart the server

Management Portal is accessible by typing at a browser the IP address of your NetWare 5.1 server. You will be prompted for your NDS username and password. Once you are granted access, the server's name, NetWare version and revision information, and total up time are displayed.

Upon logging into the Management Portal on a NetWare 5.1 server you are presented with the server's name and version, revision, and the total up time. A traffic light health indicator shows the status of the server. The indicator is also a link to the Server Health page.

Note: If the Enterprise Server is installed on your server, you will have to add the Port number (such as 8008) at the end of the IP address. For example, if your Portal server's IP address is 137.65.123.11, you would enter 137.65.123.11:8008 in the address or location field of your browser to access your server.

For more information on the Portal utility, see the AppNote entitled "An Overview of NetWare 5.1's Portal Management Utility" in this issue.

NetWare Web Manager

NetWare Web Manager is a Web-based administration tool that contains the Java and JavaScript forms you can use to configure your NetWare Enterprise Web Server, NetWare News Servers, NetWare FTP Server, NetWare Management Portal Server, as well as third-party products such as WebSphere.

After installing a Web or News Server and NetWare Web Manager, you can use your Web browser to

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navigate to the NetWare Web Manager port. You can then use its forms to configure your servers. When you submit a form, NetWare Web Manager modifies various configuration files on your NetWare server for the server you are administering.

You navigate to NetWare Web Manager through your server's IP address or URL. Depending on how you configured the computer hostname and the port number during the installation of your NetWare 5.1 server, the address could look something like this, where 2002 is the Web Manager port number: `http://myserver.novell.com:2002`.

ZENworks Starter Pack

NetWare 5.1 includes the ZENworks Starter Pack. ZENworks automates desktop management, using the power of NDS to provide application, workstation, and remote management. By automating various redundant administrative activities, ZENworks cuts costs by minimizing the time users and network administrators must devote to workstation management: users are more productive, and administrators are free to concentrate on more critical issues. The ZENworks Starter Pack contains application and workstation management functionality.

- *Application Management* provides customized software distribution. This reduces costs and simplifies administration by automatically distributing and customizing software for each user. It also ensures that users have the software tools they need to do business.
- *Workstation Management* provides directory-enabled desktop management. These policies and profiles ensure that users can roam from one network location to another while securely maintaining their familiar, personalized desktop interface and having access to printers and the applications they require.

NetWare 5.1 End User Benefits

NetWare 5.1 allows users to take full advantage of personalized Web and network features including personalized folders, Web publishing access, file transfers, discussion groups, advanced searching, and audio and video streaming.

Personalized My Network and Web Folders

NetWare 5.1 features a central location where users can go to access all of their network resources. This personalized My Network folder contains other folders for mapped drives, Web publishing, a user's directory tree and Organizational Unit Web folder, and an Office 2000 start page.

The My Network folder provides a central location on the NetWare 5.1 server from which users can access the rest of their network resources. Unlike the Network Neighborhood folder on the Windows desktop, this folder actually resides on the NetWare server instead of on users' workstations. The My Network folder is accessed via industry standard Web protocols, allowing users to view their folder from any Windows workstation that is attached to the public Internet, anywhere in the world.

Within the My Network folder, there can be personalized versions of the following items for each user:

- *Mapped Drive Web Folders.* Network administrators can set up mapped network drives for users as Web folders within each user's My Network folder. This will allow users to access their corporate

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applications and data remotely without the need for a Novell client on their workstations. (Note that Windows and DOS applications that require traditional drive mappings will not work in this environment.)

- *Personal Web Publishing Folder.* When you create login accounts for users, you usually also create a home directory or user directory somewhere on the network. If you enable the User Home Directories feature in NetWare 5.1, the My Network folder for each user will contain a link to their personal Web publishing directory, regardless of which NetWare 5.1 server their personal home directory is located on.
- *My Directory Tree Web Folder.* This folder allows users to see the contents of their NDS tree. In particular, they can see all the users and groups that have been defined within their network. They can view the properties of any object in the tree by double-clicking its icon within the Web folder. To ensure security, you can grant users rights to only modify the properties of their own User object and personal Web publishing folders.
- *My Organizational Unit Web Folder.* Users also have access to an Organizational Unit Web folder that contains all of the users in their department, as well as any other groups of users that you may have defined. Users can use their My Organizational Unit Web folder to modify the access rights to their Web folders for the users and groups over whom they have been granted access control rights.
- *Office 2000 Start Page.* The Office 2000 StartPage allows Microsoft Office 2000 users to view Web folders on a NetWare Server, as well as to search and discuss the documents that have been published there.

Web Publishing and WebDAV Support

Today, almost every company has an intranet. The task of publishing information to the intranet or any Web site is often seen as tedious, time-consuming, and primarily reserved for those more technically inclined. But with NetWare 5.1 and Microsoft Office 2000, anyone can create and publish information, transforming the Web into a central work environment for real-time collaboration and communication.

Web publishing with Microsoft Office 2000 is facilitated through NetWare 5.1's full support of the WebDAV standard. This allows users to save data to the Web as easily as to a local disk. Office 2000 behaves on NetWare the same as it does on Microsoft NT-based Internet Information Servers (IIS), making it easy for all users on your network to create and publish information.

NetWare 5.1's usage of WebDAV eliminates the need for users to learn HTTP addresses or FTP conventions. In fact, with Office 2000, posting a document to the Web is as easy as saving it to a traditional file server. When you install Office 2000 Web Publishing, it adds an object called Web Folders to the Microsoft Windows environment. In Windows NT 4.0 and Windows 95/98, Web Folders appears immediately after My Computer in the Windows Explorer hierarchical structure.

The Web Folders object contains shortcuts to Web sites. Users can create, move, rename, and delete shortcuts in Web Folders. The shortcuts can include both a URL and a display name. In Windows Explorer, you can publish by dragging files to sites in Web Folders.

Every document and directory has a URL, and access is controlled though NDS, making Web publishing with NetWare 5.1 easy and secure. Novell's security features tied to NDS include Novell International Cryptographic Infrastructure (NICI), Secure Authentication Service (SAS), and Secure Sockets Layer (SSL) authentication.

Simplified Web File Transferring

No longer is it required for users to use FTP utilities to copy content to their Web servers. Using the standard Windows Explorer, users can add, move, or delete files stored on a Web server, just as they would with files on their hard drive. To log on to an FTP site from within an Office application, users must have dial-up networking access through an ISP (Internet Service Provider) or through a proxy server on a local area network.

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Discussion Groups

NetWare 5.1 simplifies collaborating documents (such as spreadsheets, word processing documents, and presentations) and Web pages, allowing teams to easily create documents that reflect the knowledge of the entire workgroup, quickly and consistently. NetWare 5.1 allows users to employ inline discussions, where team members can share ideas within the context of a document.

As an alternative to exchanging e-mail messages or routing documents through interdepartmental mail or faxes, Office 2000 Web discussions allow users to discuss information, plans, or ideas in the browser or within Office applications. With this capability, group members can instantaneously view others' comments as they are posted. Web discussions extend workgroup interactivity in four powerful ways:

- Web discussions document conversations in threads, so that replies to a particular discussion remark can be nested directly under the remark.
- Multiple discussions can occur within the same document at the same time. Users can insert discussion remarks into the same document without having to route the document or reconcile comments in multiple copies of the same document.
- Conversations are saved in real time, so when someone inserts a discussion remark, it is immediately saved on the Web server. This means that other reviewers can see it as soon as they open or refresh the document.
- Read-only access can be granted to reviewers so they can add discussion remarks to any document, even if they do not have write-permission to it.

Users can initiate two types of discussions: a general discussion that relates to the document as a whole, or an inline discussion that relates to a specific paragraph, table, or graphic.

Advanced Web Searching

NetWare 5.1 lets users search information published on your intranet collectively rather than each independently by using the NetWare Web Search Server. The NetWare Web Search Server houses an index repository that is now associated with the network, which allows you to create a single repository of all your web content, granting the ability to search the entire intranet at once, using author, keyword, document properties, or other search criteria.

Users can also browse, list, and filter Web folders for the exact types of files they need using AutoNavigation pages. This feature is especially helpful when you need to quickly determine which file in a Web page folder (for example, an HTML document, embedded object, or graphic) you need to edit or review.

Audio and Video Broadcasts

The NetWare Multimedia Server included with NetWare 5.1 supports multimedia feeds over networks, allowing users to listen to audio and watch video streams over the network. Multimedia Server supports WAV, MP3, and RM file formats.

Web Services

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NetWare 5.1 is chock full of Web services. The Web enhancements include NetWare Enterprise Web Server, NetWare Web Search Server, NetWare FTP Server, NetWare News Server, and NetWare MultiMedia Server. Together these Web services offer organizations a fertile development environment for a Web presence both on the corporate intranet (network behind a firewall) and or the Internet.

NetWare Enterprise Web Server

At the core of NetWare 5.1's Web services is NetWare Enterprise Web Server 3.6. This version of Enterprise Server allows you to configure your NetWare server as a Web server. It can serve Web pages using the HTTP protocol to respond to requests from Web browsers and can be managed from any current browser. Requests can come from an intranet or from the World Wide Web.

Enterprise Server provides a scalable Web server platform by integrating SMP enablement to the embedded platform services. By allowing database access, script execution, HTML parsing, search, and indexing to be marshaled to available CPUs, Enterprise Server can scale even under the most resource-demanding applications.

Enterprise Web Server is installed during the initial installation of NetWare 5.1. It is at this point when you specify a port number for the administration server. The NetWare Web Server Manager helps you manage your NetWare Enterprise Web Server from the NetWare General Administration page. Besides configuring your server, from the General Administration page you can also start and stop a Web server and perform tasks for the administration server such as configuring user home directories.

You can also create multiple Web servers on your NetWare server as either hardware virtual servers or software virtual servers. Each option has its strengths and weaknesses; you should choose the one that's right for your situation. The following table lists the advantages and disadvantages of hardware and software virtual servers:

	Advantages	Disadvantages
Hardware Virtual Servers	Maps multiple IP addresses to multiple document roots. Requires fewer system resources than multiple instances of the server.	Must share the same configuration information (for example, if one server has security features or web publishing enabled, they all must have it enabled).
Software Virtual Servers	Each server has its own home page (allowing multiple Web sites from one IP address).	Maps a single IP address to multiple server names. Users must use client software that supports the HTTP host header to access the server. Must also share the same configuration information.

NetWare Enterprise Web Server 3.6 offers enhanced features that allow Web developers to choose development tools of their choice. Developers can use these tools to develop Web-based applications on the NetWare platform. Likewise, developers can also choose which databases they will use to connect with Enterprise Server.

NetWare Web Search Server

NetWare Web Search Server is a powerful, customizable search and print solution that lets you index information located on a NetWare or Web server, allowing users to effectively search and print content from multiple collections of information. It allows you to create an index for all your Web sites collectively,

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rather than just searching a single Web site. This is a real boon since it's now so easy for anyone to publish information on the intranet.

With NetWare Web Search, you can:

- Search across multi-language data collections from a single interface
- Print large collections of dispersed but related files as a single, coherently organized document
- Customize the look and feel of search and print results, and error and response messages for each language (or collectively)
- Select the information categories, products, chapters, and languages in which to conduct a search, even down to the file level
- Integrate linguistic technology modules such as Natural Language Interface and Morphology
- Integrate with a profiling engine
- Integrate with the Novell single-sign on initiative (NetWare Web Search runs from a super-thin Java client which downloads quickly and still allows clients to conduct searches in all languages)

NetWare Web Search Server allows organizations to easily create an enterprise-wide index of all the information on their intranet. Web Search also lets enterprises organize distributed information spanning multiple servers and file types into a mission-critical knowledge base. Using an intuitive search-and- browse interface-that is accessible via any Web browser whether it exists in HTML, Word, Excel, WordPerfect, or other formats-users can profit from a wealth of online information. Web Search runs automatically and continuously updates its contents so users have the most up-to-date and relevant information.

Many departments within organizations have their own Web servers allowing them to publish anything they need for their own use. There is currently no way to search all of those departmental sites with a single tool, you would need to visit each site and either browse it, or if search is available, search that site. The NetWare Web Search Server searches all of these departmental Web servers and makes all of the content searchable from one central location. This allows you to go to one site and search everything published within the company. It also allows your IS department to maintain a corporate intranet that publishes official company information, and each department to publish internal information in their own way, and at the same time make it all searchable from a single search.

Creating a search solution using NetWare Web Search involves three essential tasks:

- Defining the location of the files and documents (called a collection) you want included when a user performs a search
- Building an index for each collection
- Using the default templates, which are simple HTML pages containing Web Search variables, or create your own custom templates

When you install NetWare 5.1, the contents of the Enterprise Server's root Web directory are indexed automatically. Once you start the Enterprise Server, you can point your browser to the URL where the default search template is stored and run a search query on the contents of the root Web directory. By viewing the HTML source of the search page, you can see how the variables are used to search the index and then create your own custom search templates by rearranging or adding additional available variables.

NetWare FTP Server

The NetWare FTP Server provides FTP service for transfer of files to and from NetWare volumes. Using NetWare's FTP service, users can use the file transfer protocol command from a workstation with FTP access to log in to the NDS tree. Users from any FTP client can also perform file transfers by logging in to the NDS tree by using the FTP Server. After logging in to the NDS tree users can also navigate to other NetWare servers (in the same NDS tree) that may not be running FTP service.

The following are some of the benefits of an FTP server:

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- Fast Internet download capabilities
- Efficient services for links to Web-based URLs
- Efficient inter-company collaboration services
- Secure collaboration between organizations or companies over the Internet (FTP access to shared rights maintained via IP addresses)
- Effective archive tool from the Internet (used to back up company information)

Administrators can load the FTP server from the NetWare console by simply typing "ftpd". Users can start an FTP session from a workstation running FTP client software by typing "ftp *server_name*". To access files and directories on a remote NetWare server that may not be running the FTP service, users type "cd*//remote_server_name/volume/directory_pathname*".

NetWare News Server

The NetWare News Server provides access to external and internal news groups. The NetWare News Server makes intranet and Internet collaboration a reality by bringing the full power of open standards technology to focused discussion groups. By using the News Server for discussion groups, the people in your company can easily share information both within the company and across the Internet. For example, this is advantageous for support groups who can provide internal and external question and answer correspondence to subscribing users.

The NetWare News Server automatically generates threaded discussion groups for enhanced collaboration. News Server is capable of pulling large feeds from the Internet (up to 30 GB) that you can duplicate on your network. Or your users can create their own discussion threads.

Internally, administrators can configure the News Server to use the Lightweight Directory Access Protocol (LDAP) to access the user accounts within NDS to control user access to news groups. Using the Web-based administration interface, administrators can create new news groups on the server and provides access to specific users or groups of users.

There are several ways to configure the News Server. The simplest is a single server for internal users. In this configuration, a corporate NDS tree already exists, containing all corporate users. You install the product and configure it to access the NDS tree via LDAP. Then you create news groups and assign access to users or groups. The users, using standard news readers (such as Microsoft Outlook Express), access the news groups and participate as desired.

You can also allow internal users to access an external news feed. This configuration is identical to the previous except that the administrator configures the news server to access news feeds from external servers. These external news feeds are then accessible to the internal users as standard news groups. Another option is for a company to create their own news server and allow its customers to share and exchange information. There might also be internal users who read and post messages to the news groups or answer customer questions. Larger corporation with multiple divisions can also operate separate news servers, while allowing their users to share information across divisional boundaries.

NetWare MultiMedia Server

The NetWare MultiMedia Server enables multimedia features on a NetWare server that provides streaming audio and video access for network users. NetWare MultiMedia Server is easy to implement and use, and clients only need RealPlayer G2, from RealNetworks Inc., to play the multimedia files from the server. The NetWare MultiMedia Server supports the Real Time Streaming Protocol (RTSP) and HTTP for streaming audio and video on the network.

The MultiMedia Server also enables interactive information sessions to be held with customers. It can be used for product support or for troubleshooting common issues. It can also be used to gather information from customers. The NetWare MultiMedia Server contains the Real server on NetWare to serve Real Player G2 for the following protocols and file types:

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- HTTP
- RTSP
- .RM files
- .WAV files
- .MPG files

Application and E-Business Services

This section describes several popular Web application development tools that are included with NetWare 5.1 to allow you to create powerful Internet commerce solutions for your customers and users.

IBM WebSphere Application Server

WebSphere allows developers to build and deploy complete Web-based solutions that run on the NetWare 5.1 platform. IBM WebSphere for NetWare supports open industry standards, so you can integrate WebSphere with your current network investment to build, run, and manage e-commerce applications on NetWare.

WebSphere for NetWare provides a platform with a robust Web application service infrastructure with its support for servlets, Java Server Pages, XML (eXstensible Markup Language), Enterprise Java Beans (EJB), transactional processing, and robust database connectivity. WebSphere provides the underpinnings for future corporate automation and e-commerce solutions that execute on Novell's high performing Jave Virtual Machine.

For more information about WebSphere, see the AppNote entitled "An Introduction to WebSphere: The Next-Generation Web Application Server" in this issue.

Oracle 8i

NetWare 5.1 includes Oracle8i-release 8.1.5 of Oracle's Object Relational Database Management System (ORDBMS)-Enterprise Edition for NetWare. Oracle8i is designed specifically to be an Internet development and deployment platform. It enhances the Oracle8 technology with special features that make it easier for developers and systems integrators to create corporate intranets and Web applications.

Oracle8i for NetWare provides:

- Maximum performance and scalability through its unique design with the NetWare multi-threaded architecture. In addition, Oracle8i for NetWare has been optimized to take full advantage of NetWare's multi-tasking and input/output (I/O) capabilities.
- Automatic authentication of users by the NetWare operating system.
- Central, easy-to-use Graphical User Interface (GUI) distributed database management using Oracle Enterprise Manager.
- Ability to build and deploy Java-stored procedures with Oracle's JVM.

The key development component of NetWare 5.1 is the Universal Component System (UCS). UCS is the glue that ties external component logic together. From the scripting choices, you can access services on NetWare such as NDS authentication services, or you can link dynamic HTML pages to any ODBC-

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compliant database on NetWare, NT, or Unix. With UCS you can even execute remote logic such as ActiveX controls on an NT server to provide a single repository for business logic on the Web server platform. Since you have disparate data and logic in real world application development, NetWare 5.1, through UCS, is designed to be the access point to execute your organization's applications.

Halcyon InstantASP

Halcyon Software's InstantASP is included with NetWare 5.1 to provide deployment of ASP applications without modifying NetWare much, or none at all, depending on the application. InstantASP allows Java implementation of Microsoft Active Server Pages Framework, remote Java ActiveX Server (R-JAX), and source code conversion from Active Server Pages to Java Server Pages.

Novell JVM for NetWare

The Novell JVM for NetWare allows Java applications to run on a NetWare server, turning general Java applications into tailored commands. You can use the Novell JVM for NetWare to enhance your intranet applications and e-commerce sites by running servlets, JavaBeans, Java Server Pages, and other Java development components on a NetWare server.

Installation Requirements

To install NetWare 5.1, you need a dedicated computer that meets the following requirements:

- A server-class PC with a Pentium or higher processor
- A VGA or higher resolution display adapter (SVGA recommended)
- A DOS partition of at least 50 MB with 35 MB available space (standard NetWare products and WebSphere for NetWare require 1.3 GB on volume SYS)
- Standard NetWare products require 128 MB of RAM (WebSphere for NetWare requires 256 MB, but 512 MB is recommended)
- One or more network boards
- A CD drive that can read ISO 9660-formatted CD disks (bootable CD drives must fully support the El Torito specification)
- A PS/2 or serial mouse is recommended, but not required

Conclusion

NetWare 5.1 provides more than just the traditional file and print services. It allows you to create a complete Web-based environment by including all the necessary tools to enhance communication both inside and outside your company.

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Use NetWare 5.1 to create a Web presence that your clients, customers, and potential customers can access. Create an extranet. Create an e-commerce solution. Link Web content to your WebSphere or Oracle database. Do it all, and continue using the NetWare file and print services you trust.

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