

NetStorage Administration Guide

**Novell®
NetWare®**

6.5 SP8

November 9, 2009

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Contents

About This Guide	7
1 NetStorage Overview	9
1.1 How NetStorage Works	9
1.2 What Users See When They Access NetStorage	10
1.3 What's Next	11
2 What's New	13
3 Installing NetStorage	15
3.1 Requirements	15
3.2 Installing Novell NetStorage During the NetWare 6.5 Installation	15
3.3 Installing Novell NetStorage after the NetWare 6.5 Installation	17
3.4 What's Next	17
4 Using NetStorage	19
4.1 Accessing NetStorage	19
4.2 Viewing or Modifying Directory and File Attributes and Rights	20
4.3 Accessing Archived Files	21
4.3.1 What Files Are Versioned	21
4.3.2 Accessing File Versions	21
4.4 Setting Directory Quotas on NSS Volumes and Directories	22
4.5 Purging and Salvaging Deleted NSS Files	23
5 Configuring NetStorage with Novell Cluster Services	25
5.1 NetStorage Installation and Configuration	25
5.2 Novell Cluster Services Configuration and Setup	26
5.2.1 Prerequisites	26
5.2.2 Creating a NetStorage Cluster Resource	26
5.2.3 Editing NetStorage Load and Unload Scripts	27
5.2.4 Setting the NetStorage Resource Start, Failover, and Failback Modes	28
5.2.5 View or Edit NetStorage Resource Server Assignments	29
5.2.6 Accessing NetStorage After Cluster Configuration	30
6 Administering NetStorage	31
6.1 Using iManager to Administer NetStorage	31
6.2 Understanding the NetStorage Configuration Settings	32
6.2.1 Authentication Domains	32
6.2.2 Current Sessions	33
6.2.3 Files	33
6.2.4 iFolder Storage Provider	34
6.2.5 NetWare Storage Provider	34
6.2.6 NetStorage Options	36
6.2.7 NetStorage Statistics	37

6.2.8	Resource Usage	37
6.2.9	WebDAV Provider	37
6.2.10	Storage Location	37
6.3	What's Next	40
7	Troubleshooting NetStorage	41
7.1	Unexpected Results from Login Scripts	41
7.2	Logging In As a Different User	41
7.3	Slow Login	42
7.4	Configuring LDAP Contextless Login for use with NetStorage	42
7.5	Novell iFolder 2.x and NetStorage	43
7.6	Character Set Issues with Netscape	43
7.7	Configuring NetStorage With iChain	43
7.7.1	Enabling Cookieless Authentication	44
7.7.2	Editing the logout.html.utf8 File	44
7.8	Phantom Folders	44
A	Security Considerations	45
A.1	Security Features	45
A.2	Security Configuration	46
A.2.1	NetStorage Configuration Settings	46
A.2.2	Security Information for Other Products	46
A.3	Security Recommendations	47
A.3.1	Registry Access Control	47
A.3.2	Use NMAS	48
A.3.3	Use SSL With Your Web Server	48
A.3.4	Persistent and Session Cookies	48
A.3.5	Use Web Server Logs	48
A.3.6	Use XTLog	48
A.3.7	Denial of Service Attacks	49
A.3.8	Trusted Roots in CAPI	49
A.3.9	Certificate Validation Registry Setting	49
A.4	Other Security Considerations	49
B	Documentation Updates	51
B.1	November 9, 2009	51
B.2	October 2008 (NetWare 6.5 SP8)	51
B.3	October 25, 2006 (NetWare 6.5 SP6)	51

About This Guide

This NetStorage guide includes information on Novell® NetStorage, which provides secure Internet-based access to files and folders on a NetWare® server in your network through either a browser or Microsoft® Web Folders.

The following are included in this guide:

- ♦ Chapter 1, “NetStorage Overview,” on page 9
- ♦ Chapter 2, “What's New,” on page 13
- ♦ Chapter 3, “Installing NetStorage,” on page 15
- ♦ Chapter 4, “Using NetStorage,” on page 19
- ♦ Chapter 5, “Configuring NetStorage with Novell Cluster Services,” on page 25
- ♦ Chapter 6, “Administering NetStorage,” on page 31
- ♦ Chapter 7, “Troubleshooting NetStorage,” on page 41
- ♦ Appendix A, “Security Considerations,” on page 45

Audience

The audience for this document is network administrators. This documentation is not intended for users of the network.

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We want to hear your comments and suggestions about this manual and the other documentation included with this product. Please use the User Comments feature at the bottom of each page of the online documentation, or go to www.novell.com/documentation/feedback.html (<http://www.novell.com/documentation/feedback.html>) and enter your comments there.

Documentation Updates

For the most recent version of this guide, see the [NetWare 6.5 SP8 Documentation Web site](http://www.novell.com/documentation/nw65) (<http://www.novell.com/documentation/nw65>).

Additional Documentation

For information about Novell iManager, see the [Novell iManager 2.7 Administration Guide](http://www.novell.com/documentation/imanager27/) (<http://www.novell.com/documentation/imanager27/>).

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NetStorage Overview

1

NetStorage provides secure Internet-based access to files and folders on a NetWare® server in your network, using either a browser or Microsoft Web Folders (Microsoft's implementation of WebDAV). NetStorage authentication relies on the power of Novell® eDirectory™ to provide secure access, so Internet-based access is as secure as accessing files from within the network.

Novell NetStorage includes the following benefits:

- ♦ Lets users securely copy, move, rename, delete, read, and write files between any Internet-enabled machine and a NetWare server on your network.
- ♦ Lets users access archived copies of their files (see the *NW 6.5 SP8: Novell Archive and Version Services 2.1 User Guide*).
- ♦ Eliminates the need to use a virtual private network (VPN) client to access files.
- ♦ Eliminates the need to e-mail or copy data from one machine to another.
- ♦ Supports Internet standards such as HTTP, HTTPS, HTML, XML, and WebDAV.
- ♦ Supports the use of drive mappings that users are accustomed to when they log in through the Novell Client™ (see [Section 1.2, “What Users See When They Access NetStorage,” on page 10](#)).
- ♦ Provides access to network files and folders via NetWare WebAccess and Novell exteNd Director™ 4.1 Standard Edition.
- ♦ Supports Storage Location objects used to display a specified name for a network directory in the NetStorage directory access list displayed through Microsoft Web Folders or a Web browser (see [“Storage Location” on page 37](#)).

With NetStorage installed on one NetWare 6.5 server, users can potentially have access to any NetWare 5 or later server anywhere on your geographically dispersed network.

- ♦ [Section 1.1, “How NetStorage Works,” on page 9](#)
- ♦ [Section 1.2, “What Users See When They Access NetStorage,” on page 10](#)
- ♦ [Section 1.3, “What's Next,” on page 11](#)

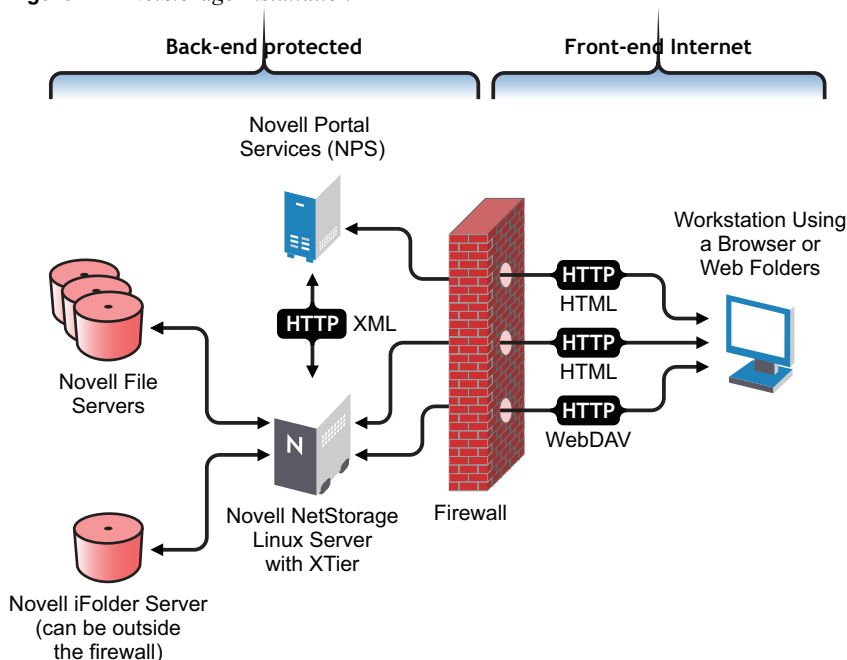
1.1 How NetStorage Works

NetStorage is installed on one NetWare 6.5 server that acts as a Middle Tier (also known as XTier) server. Middle Tier server configuration information is stored in the NetWare registry and Novell iManager provides an easy method for changing Middle Tier server registry entries. XTier is the Novell Web services framework and is used by various Novell products.

NOTE: Previous versions of NetStorage were administered with the NSAdmin utility. Configuration should now be done through Novell iManager.

After the Middle Tier server is set up, it appears as an Internet Web server to users and can be accessed either with a Web browser or with Microsoft's Web Folders. NetStorage also provides a gadget that provides access through Novell exteNd Director™ 4.1 Standard Edition.

Figure 1-1 NetStorage Installation



The Middle Tier server communicates with the Novell file servers in the network and provides secure authentication using eDirectory and the users' usernames and passwords.

All transactions can also be encrypted by using SSL to increase the security.

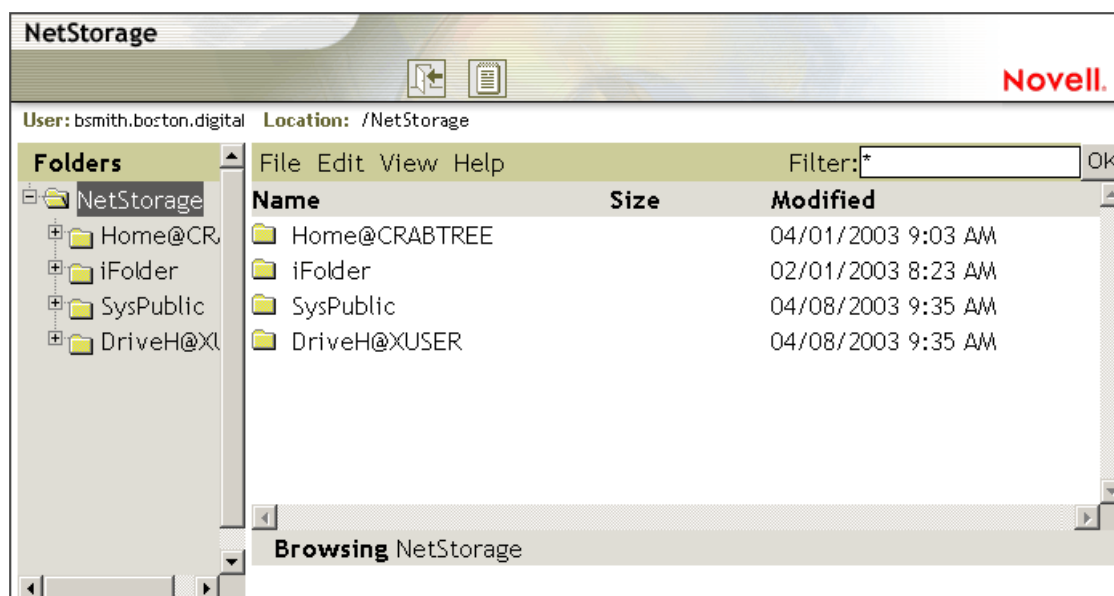
NOTE: Although SSL can be used to encrypt transactions, no server authentication is performed.

For more detailed information on creating and using login scripts, see “[Setting Up Login Scripts](#)” in the *Novell Client 4.91 SP5 for Windows XP/2003 Installation and Administration Guide*. For specific information on how login scripts are processed by NetStorage, see the “[Login Script Processing by NetStorage](#)” [TID10068983](http://support.novell.com/cgi-bin/search/searchtid.cgi?/10068983.htm) (<http://support.novell.com/cgi-bin/search/searchtid.cgi?/10068983.htm>).

1.2 What Users See When They Access NetStorage

The NetStorage Web page displays the network files and folders currently accessible for each user. NetStorage reads the user's login script to determine drive mappings, reads eDirectory User object properties to determine the path to the user's home directory, then displays a list of files and folders based on the mapped drives and home directories. If Storage Location objects have been created and the user has rights to view these objects, the directories associated with these objects are also displayed.

Figure 1-2 NetStorage Folder View



NetStorage reads the container, profile, and user login scripts only from the primary eDirectory server specified during the installation, and displays the user's drive mappings based only on those login scripts. However, because login scripts were designed to be processed by the Novell Client on the user's workstation, NetStorage processes only a subset of the login script functions.

TIP: If you specified alternate IP addresses or DNS names of servers in other eDirectory trees during the NetStorage installation, NetStorage reads the User object properties in the other eDirectory trees and also displays those home directories. This is useful if a user normally logs in to more than one eDirectory tree and you want that user to have access to additional home directories in different eDirectory trees through NetStorage. The User object name must be the same for each eDirectory tree.

NetStorage processes login scripts in order to find MAP statements. Each MAP statement defines a NetWare file system storage resource that the user can access through NetStorage. IF, ELSE, END, INCLUDE, and EXIT commands are also recognized by NetStorage. All other login script statements are treated as comments and ignored. Finally, login script variables are also recognized. Variables are preceded by a percent sign (%).

Users might have specific eDirectory rights to certain files and folders on your network but cannot access those files and folders through NetStorage unless login script drive mappings exist to those folders or the files and folders are in the user's home directory. If you want to provide users with NetStorage access to a specific folder, you might need to add a drive mapping command to that folder in a login script (container, profile, or user).

1.3 What's Next

For more information on installing NetStorage, see [Chapter 3, “Installing NetStorage,”](#) on page 15.

If you need to provide users with information on how to use NetStorage, see [Chapter 4, “Using NetStorage,”](#) on page 19.

After you have installed NetStorage, you can administer settings. See [Chapter 6, “Administering NetStorage,”](#) on page 31.

If you need to troubleshoot issues with NetStorage, see [Chapter 7, “Troubleshooting NetStorage,”](#) on page 41.

What's New

2

There are no feature changes in this release of NetStorage.

Installing NetStorage

3

NetStorage can be installed as an optional component during the manual NetWare® 6.5 installation or it can be installed after the installation. For most networks, you need NetStorage installed on only one server; however, this might vary depending size and your organization's needs. For example, if your company is geographically dispersed, you might want to install NetStorage on one server in each geographic region.

During the NetStorage installation, you are prompted for configuration information that is necessary for NetStorage to function properly. If you change the NetStorage configuration later, you must either reinstall or use Novell® iManager to change the configuration. For more information on iManager, see [Chapter 6, “Administering NetStorage,” on page 31](#).

3.1 Requirements

In addition to meeting the requirements for NetWare 6.5, NetStorage requires the following:

- ☐ **Server Requirements:** At least one NetWare 6.5 server in the Novell eDirectory™ tree where NetStorage will be installed.

An eDirectory replica is not required to be on the same server where NetStorage is installed.

IMPORTANT: In order to avoid time issues, this server must have time set correctly according to your network specifications. If time is not set, workstations might not be able to access files.

- ☐ **Workstation Requirements:** Netscape* Navigator* 4.7 or later, Internet Explorer 5.5* or later, or Microsoft Web Folders.

3.2 Installing Novell NetStorage During the NetWare 6.5 Installation

- 1 Start the NetWare 6.5 installation (either Default or Manual) and continue until you get to the page requiring you to choose component options.

The NetWare 6.5 installation includes several steps not described here because they do not directly relate to this installation. For more detailed instructions on the installation, see “[Installing NetWare 6.5 SP8 \(Physical\)](#)” in the *NW65 SP8: Installation Guide*.

- 2 When the Choose a Solution page appears, select *Manual NetWare*, then click *Next*.

You can also install other products during this installation.

Continue through the installation until you get to the page that lists the different installation types.

- 3 Select the *Customized NetWare Server* installation option.

- 4 In the Components page, select the *Novell NetStorage*, *Apache 2 Web server*, and *iManager* check boxes, along with the other components you want installed with NetWare 6.5, then click *Next*.

Continue with the installation process.

- 5** When you reach the NetStorage Install page, specify the IP address or registered DNS name of a server in your eDirectory tree that has the master replica or a read/write replica of eDirectory.

The primary eDirectory server URL is required for NetStorage to function properly. This does not need to be the IP address or DNS name of the server where NetStorage is to be installed.

When a user attempts to log in, NetStorage searches the eDirectory database on the server you specify for the User object. If the User object is found, NetStorage attempts to authenticate the user to eDirectory.

If you know the eDirectory context for the users that will use NetStorage, you can add that context to the URL by inserting a colon (:) between the IP address or DNS name and the eDirectory context. The context is optional. If no context is specified, NetStorage searches the entire eDirectory tree on the primary eDirectory server for User objects.

For example, if the IP address of the server is 127.0.0.1 and the eDirectory context for your users is personnel, then you would add 127.0.0.1:personnel to the field.

- 6** (Optional) Specify IP addresses or DNS names of servers in other eDirectory trees that have at least read/write eDirectory replicas, or specify the same IP address or DNS name you used for the primary eDirectory server but with a different context.

You can add two alternate eDirectory server IP addresses or DNS names and context settings. These alternate settings are used to allow NetStorage to find User objects that exist in contexts other than what you specified for the primary eDirectory server. The alternate settings also allow NetStorage to find User objects with the same name in different eDirectory trees. Although the alternate URL and context settings are optional, they can help provide an additional level of access to NetStorage.

- 7** (Optional) Specify the IP address or DNS name and the port number that you assigned to Novell iFolder[®] 2.x.

The iFolder DNS name or IP address and the port number are optional but, if specified, they allow NetStorage users to access and manipulate files and directories in their iFolder directories on the iFolder 2.x server.

Users must have their iFolder user accounts enabled through the iFolder server in order to access their files stored in iFolder using NetStorage. You must also enable the ability for users to set iFolder passphrases in NetStorage. For more information on iFolder, see the [Novell iFolder 2.1 online documentation \(http://www.novell.com/documentation/lg/ifolder21/index.html\)](http://www.novell.com/documentation/lg/ifolder21/index.html).

TIP: If you are installing NetStorage during the NetWare 6.5 installation, you can click the *Back* button to go back and view the screen where the IP address and port number assignments were made. This does not need to be the IP address or DNS name of the server where NetStorage is to be installed.

- 8** (Conditional) If you are running in a clustered environment, install NetStorage on two nodes in the cluster, using the identical configuration used on the first server.

The default configuration for Apache2 on NetWare 6.5 is to listen on all IP addresses. This is done with a Listen directive in `sys:\Apache2\conf\httpd.conf` that only specifies a port and doesn't have a specific IP address. If you have modified the default configuration to listen

on a specific IP address, and you want the server to be a part of a cluster, you should either remove the specific IP address or add another Listen directive that does not specify an IP address so that Apache2 listens on all IP addresses.

For more information about running NetStorage in a clustered environment, see “[Configuring NetStorage with Novell Cluster Services](#)” in the *Novell Cluster Services Resource Configuration Guide*.

After you install NetStorage, it will start automatically when you start your NetWare 6.5 server. If NetStorage is not accessible, restart the NetWare 6.5 server where NetStorage is installed.

3.3 Installing Novell NetStorage after the NetWare 6.5 Installation

If you did not install NetStorage during the NetWare 6.5 installation, you can install it later by completing the following steps:

- 1 Insert the *NetWare 6.5 Products* CD into your NetWare 6.5 server.
You might need to load `cddvd.nss` on the server to access this CD.
- 2 From the Novell menu on the NetWare 6.5 console GUI, select *Install*.
- 3 Click *Add*, then browse to the root of the *NetWare 6.5 Products* CD.
- 4 Select the `postinst.ni` file, then click *OK*.
- 5 Select the *NetStorage*, *Apache*, and *iManager* check boxes and deselect all other components or products unless you specifically want to install them.
- 6 Go to [Step 5 on page 16](#) to complete the NetStorage installation.
- 7 Restart the NetWare 6.5 server.

After you install NetStorage, it starts automatically when you start your NetWare 6.5 server. If NetStorage does not start automatically, restart the NetWare 6.5 server where NetStorage is installed.

3.4 What's Next

After you have installed NetStorage, inform users that they can access their files from the Web. Instructions for accessing files using NetStorage are available in [Chapter 4, “Using NetStorage,” on page 19](#).

Users might have specific eDirectory rights to certain files and folders on your network but cannot to access those files and folders through NetStorage unless storage location objects have been created, login script drive mappings exist to those folders, or the files and folders are in the user's home directory. If you want to provide users with NetStorage access to a specific folder, you might need to add a drive mapping command to that folder in a login script (container, profile, or user).

If you need to change the NetStorage configuration, use iManager. See [Chapter 6, “Administering NetStorage,” on page 31](#).

Using NetStorage

4

NetStorage provides secure Internet-based access to files and folders on a NetWare® server in your network, using either a browser or Microsoft® Web Folders (Microsoft's implementation of WebDAV). NetStorage authentication relies on the power of Novell® eDirectory™ to provide secure access, so Internet-based access is as secure as accessing files from within the network.

Based on how NetStorage has been configured, the NetStorage Web page displays the network files and folders you have access to. NetStorage reads your NetWare login script to determine drive mappings, reads eDirectory User object properties to determine your home directory, then displays a list of files and folders based on mapped drives and home directories. If you usually log in to more than one eDirectory tree, you might have access to additional home directories in different eDirectory trees. If you have a Novell iFolder® 2.x account, this account is also displayed. However, some NetStorage features such as Download for Editing are not available with Novell iFolder.

NetStorage reads the container, profile and user login scripts only from the primary eDirectory server specified during the installation, and displays the user's drive mappings based on those login scripts.

Users might have specific eDirectory rights to certain files and folders on your network but cannot access those files and folders through NetStorage unless login script drive mappings exist to those folders or the files and folders are in the user's home directory. If you want to provide users with NetStorage access to a specific folder, you might need to add a drive mapping command to that folder in a login script (container, profile, or user).

4.1 Accessing NetStorage

To access NetStorage from a workstation:

- 1 Start your browser or Microsoft Web Folders and specify the URL for NetStorage.

The URL is `http://server_ip_address/oneNet/NetStorage/`. Replace *server_ip_address* with the IP address or DNS name of the server running NetStorage or the IP address for Apache-based services. If Apache-based services use a port other than 80, you must also specify that port number with the URL.

For example, if the IP address for NetStorage is 127.1.1.1, then you would specify `127.1.1.1/oneNet/NetStorage/`.

In the above example, if you had changed the port number to 51080, then you would specify `127.1.1.1:51080/oneNet/NetStorage/`.

Although the `oneNet` portion of the URL is required if you are using WebDAV (Web Folders), it is not required if you are using a browser. In a browser, you can just use `127.1.1.1/NetStorage/`.

The date and time on the workstation being used to access NetStorage should be (within a few hours) of the date and time on the server running NetStorage to avoid conflicts.

- 2 Enter your username and password.

NetStorage uses your Novell eDirectory username and password, so you don't need to remember or use a separate username or password.

You can use many of the same conventions for expanding and contracting folders and opening files that are available in Windows Explorer. To create new folders or to copy, delete, rename, move, or download existing files with a browser, click the *File* menu. If you are using Internet Explorer, you can copy and move files and folders by dragging and dropping them. This functionality is not available with browsers other than Internet Explorer.

Clicking the *Folder View* button in the browser window displays folders in another column and lets you expand and contract folders. The Text View displays only the files and folders in the current directory and does not let you expand or contract folders. Clicking the *Name*, *Size*, or *Modified* headings lets you sort directory and file listings in ascending or descending order by name, size, or date.

Local files and folders are not accessible using NetStorage. Also, you cannot map drives or change login scripts from NetStorage.

4.2 Viewing or Modifying Directory and File Attributes and Rights

NetStorage provides the ability to view or change NSS directory and file rights. This is particularly useful if you need to change directory and file rights, but do not have Novell Client™ software installed or running on a client workstation.

To view or modify directory or file rights using NetStorage

- 1 Start your browser and specify the URL for NetStorage.

The URL is `http://server_ip_address/oneNet/NetStorage/`. Replace *server_ip_address* with the IP address or DNS name of the server running NetStorage or the IP address for Apache-based services. If Apache-based services use a port other than 80, you must also specify that port number with the URL.

For example, if the IP address for NetStorage is 127.1.1.1, then you would specify `127.1.1.1/oneNet/NetStorage/`.

In the above example, if you had changed the port number to 51080, then you would specify `127.1.1.1:51080/oneNet/NetStorage/`.

Although the oneNet portion of the URL is required if you are using WebDAV (Web Folders), it is not required if you are using a browser. In a browser, you can just use `127.1.1.1/NetStorage/`.

The date and time on the workstation being used to access NetStorage should be (within a few hours) of the date and time on the server running NetStorage to avoid conflicts.

- 2 Enter your username and password.

NetStorage uses your Novell eDirectory username and password, so you don't need to remember or use a separate username or password.

- 3 Right-click the directory or file you want to view or modify attributes or rights for and select *Properties*.

- 4 Click the *NetWare Info* tab to view or modify attributes or the *NetWare Rights* tab to view or modify rights.

For more information on directory and file attributes and rights, see the *Novell Client 4.91 SP5 for Windows XP/2003 Installation and Administration Guide*.

NOTE: Viewing or changing directory and file attributes and rights through NetStorage is only possible with a browser. This functionality is not available through Microsoft Web Folders.

4.3 Accessing Archived Files

Novell Archive and Version Services provides a convenient and cost-effective way for you to instantly restore previous versions of your modified, deleted, or lost files. If your administrator configured your network files for versioning, historical copies of your files might exist in an archive database.

IMPORTANT: You can use NetStorage to access previous versions of archived files, but NetStorage cannot be used to restore archived deleted directories. You must use NWVer to restore archived directories that have been deleted.

For information about Novell Archive and Version Services, see the *NW 6.5 SP8: Novell Archive and Version Services 2.1 User Guide*.

- ♦ [Section 4.3.1, “What Files Are Versioned,” on page 21](#)
- ♦ [Section 4.3.2, “Accessing File Versions,” on page 21](#)

4.3.1 What Files Are Versioned

Your administrator sets criteria to determine which files are eligible for versioning. Files can be included or excluded according to the path, file extension, or filename patterns. If your files meet the inclusion criteria, they are eligible for versioning.

Versioning occurs at scheduled intervals, called epochs. It does not matter how much or how often you change a file during the epoch; whatever state an eligible file is in when the epoch ends is the version that is saved in the archives. This means that a file’s lifetime must span the end of an epoch to be versioned.

Versioned files might have a limited life in the archive, depending on the delete policies your administrator sets. The administrator sets the maximum keep time and the maximum number of versions to retain. The delete policy for some volumes can allow indefinite retention of versioned files.

For information about the versioning policies for your files, contact your Archive and Version Services administrator.

4.3.2 Accessing File Versions

You can access previous versions of your files whenever you need to by using the NetStorage interface.

- 1 Log in to NetStorage.
- 2 Select a file or directory that you want to see previous versions of.
- 3 Right-click to open the pop-up menu.
- 4 Click *Archive*.

To restore a previous version of the file:

- 1 Navigate through the Archive dialog boxes to find the file you want to see previous versions of.
For information about navigating through the Archive dialog boxes, see the *NW 6.5 SP8: Novell Archive and Version Services 2.1 User Guide*.
- 2 Review the time stamps of the file versions, then select the version of the file that you want to restore.
- 3 In the *Restore To* field, type the path and filename where you want to restore the version, or browse to that location, type a filename, then click *OK*.
- 4 Click *Restore*.

WARNING: The restored version overwrites any file by that name in the Restore To location.

4.4 Setting Directory Quotas on NSS Volumes and Directories

You can use NetStorage to create or change directory quotas on NSS volumes and directories for both NetWare and Linux. See “*Managing Space Quotas for Volumes, Directories, and Users*” in the *NW 6.5 SP8: NSS File System Administration Guide*. You must be a user with rights equivalent to the Admin user to create or change directory quotas.

- 1 Start your browser and specify the URL for NetStorage.

The URL is `http://server_ip_address/oneNet/NetStorage/`. Replace *server_ip_address* with the IP address or DNS name of the server running NetStorage or the IP address for Apache-based services. If Apache-based services use a port other than 80, you must also specify that port number with the URL.

For example, if the IP address for NetStorage is 127.1.1.1, then you would specify `127.1.1.1/oneNet/NetStorage/`.

In the above example, if you had changed the port number to 51080, then you would specify `127.1.1.1:51080/oneNet/NetStorage/`.

Although the oneNet portion of the URL is required if you are using WebDAV (Web Folders), it is not required if you are using a browser. In a browser, you can just use `127.1.1.1/NetStorage/`.

The date and time on the workstation being used to access NetStorage should be (within a few hours) of the date and time on the server running NetStorage to avoid conflicts.

- 2 Enter your username and password.
NetStorage uses your Novell eDirectory username and password, so you don't need to remember or use a separate username or password.
- 3 Right-click the directory or file you want to create or change a directory quota for and select *Properties*.
- 4 Click the *NetWare Info* tab and then click the *Restrict size* check box.
- 5 Specify the directory size limit and click *Apply* to save your changes.

4.5 Purging and Salvaging Deleted NSS Files

You can use NetStorage to purge and possibly undelete NSS files that were previously deleted.

- 1 Access NetStorage, and in the left column, select the directory where the deleted files were.
- 2 Click *View* and then *Show Deleted Files*.
- 3 Select the boxes next to the files you want to undelete or purge.
- 4 Click *File*, then click either *Purge* or *Undelete*.

Configuring NetStorage with Novell Cluster Services

5

NetStorage provides secure Internet-based access to files and folders on a NetWare® server on your network using either a browser or Microsoft Web Folders (Microsoft's implementation of WebDAV). If the NetWare® 6.5 server running NetStorage goes down, Internet-based access to files and folders is not possible. Configuring NetStorage with Novell® Cluster Services™ helps ensure that Internet-based access to files and folders can continue even if a server running NetStorage goes down.

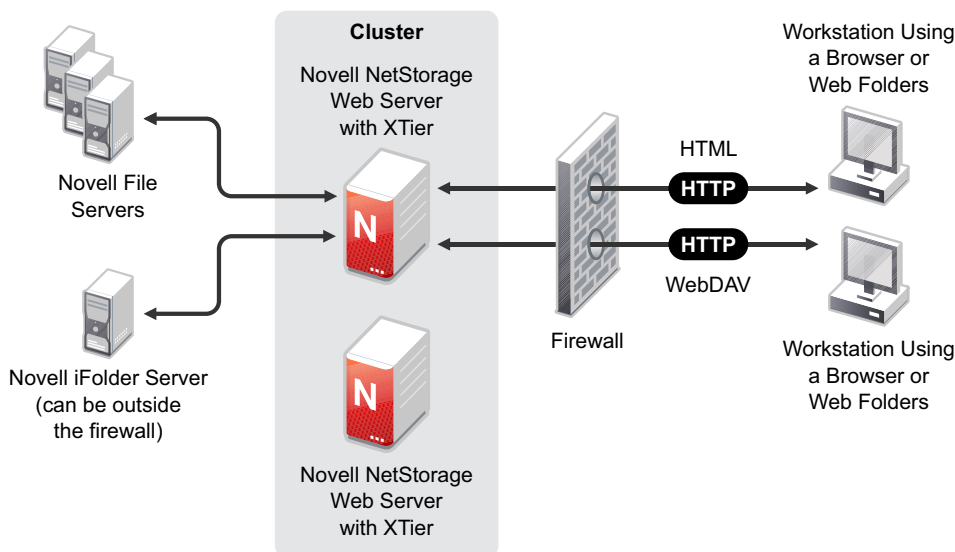
- ♦ [Section 5.1, “NetStorage Installation and Configuration,” on page 25](#)
- ♦ [Section 5.2, “Novell Cluster Services Configuration and Setup,” on page 26](#)

5.1 NetStorage Installation and Configuration

Novell NetStorage software is included with NetWare 6.5 and can be installed during the NetWare 6.5 installation. You must select the Customized NetWare Server installation option and select the Novell NetStorage component check box to install NetStorage during the NetWare 6.5 installation. Because NetStorage requires iManager and Apache*, you must also select the Apache Web server and iManager check boxes. See [Chapter 3, “Installing NetStorage,” on page 15](#) for more information on installing and configuring NetStorage.

Because most networks require NetStorage to be installed on only one server, it is generally only necessary to install NetStorage on two servers in the cluster. Users gain access to files and folders by connecting to one NetStorage server. The other NetStorage server acts as a backup in case the first NetStorage server fails. The following figure shows how a typical NetStorage cluster configuration might look.

Figure 5-1 Cluster Configuration for NetStorage on NetWare



When you install NetStorage with NetWare 6.5, you are asked to specify the DNS name or IP address of the Primary eDirectory™ Server. This is the IP address or registered DNS name of a server in your eDirectory tree that has the master replica or a read/write replica of eDirectory. If you have iFolder installed on your network, you are also asked to specify the DNS name or IP address of for iFolder. For NetStorage to function properly in a cluster, you must specify the same DNS name or IP address for the primary eDirectory Server on all servers in the cluster that have NetStorage installed. The same is true for iFolder. If you have iFolder installed, you must also specify the same iFolder DNS name or IP address on all servers in the cluster.

Any NetStorage-specific configuration changes made to one NetStorage server must be made on all other NetStorage servers in the cluster. In order for NetStorage to function properly with Novell Cluster Services, all NetStorage servers in the cluster must be identically configured.

5.2 Novell Cluster Services Configuration and Setup

- [Section 5.2.1, “Prerequisites,” on page 26](#)
- [Section 5.2.2, “Creating a NetStorage Cluster Resource,” on page 26](#)
- [Section 5.2.3, “Editing NetStorage Load and Unload Scripts,” on page 27](#)
- [Section 5.2.4, “Setting the NetStorage Resource Start, Failover, and Failback Modes,” on page 28](#)
- [Section 5.2.5, “View or Edit NetStorage Resource Server Assignments,” on page 29](#)
- [Section 5.2.6, “Accessing NetStorage After Cluster Configuration,” on page 30](#)

5.2.1 Prerequisites

Novell Cluster Services must be installed and running on the servers that have NetStorage installed before performing the remainder of the NetStorage and Novell Cluster Services configuration. For information, see [“Installation and Setup”](#) in the *NW6.5 SP8: Novell Cluster Services 1.8.5 Administration Guide*.

IMPORTANT: Because NetStorage is installed and configured identically on the cluster servers where it will run and because that configuration information is stored on each server, no shared storage is required to run NetStorage with Novell Cluster Services.

5.2.2 Creating a NetStorage Cluster Resource

A cluster resource containing a secondary IP address is necessary to ensure that users continue to have access to NetStorage if a server running NetStorage go down.

Novell Cluster Services includes a Generic IP Service resource template, which simplifies the process for creating a NetStorage cluster resource.

- 1 Start your Internet browser and enter the URL for iManager.

The URL is `http://server_ip_address/nps/imanager.html`. Replace *server_ip_address* with the IP address or DNS name of a server in the cluster or with the IP address for Apache-based services.

- 2 Enter your username and password.

- 3 In the left column, click *Clusters*, then click the *Cluster Options* link.
iManager displays four links under *Clusters* that you can use to configure and manage your cluster.
- 4 Browse to locate and select the Cluster object of the cluster you want to manage, then click the *New* link.
- 5 Specify Resource as the resource type you want to create by clicking the *Resource* radio button, then click *Next*.
- 6 Specify a name for the NetStorage cluster resource that you want to create.
Do not use periods in cluster resource names. Novell clients interpret periods as delimiters. If you use a space in a cluster resource name, that space is converted to an underscore.
- 7 In the *Inherit From Template* field, select the *Generic_IP_Service* template.
- 8 Select the *Define Additional Properties* check box, then click *Next*.
- 9 Select the Define Additional Properties check box, click *Create*, then continue with [Section 5.2.3, “Editing NetStorage Load and Unload Scripts,” on page 27](#).
The Generic IP Service template helps configure the NetStorage cluster resource by automatically creating load and unload scripts, setting failover and failback modes, and assigning the resource to all nodes in the cluster.
You should only assign the resource to those nodes in the cluster that have NetStorage installed and running.

5.2.3 Editing NetStorage Load and Unload Scripts

The Generic IP Service resource template automatically creates load and unload scripts to start and stop the NetStorage resource on servers in your cluster. The scripts contain commands that you must customize for your specific NetStorage configuration.

If you are creating a new cluster resource, the load script page should already be displayed. You can start with [Step 5](#).

- 1 In iManager, click *Clusters*, then click *Cluster Options*.
- 2 Browse to locate and select the Cluster object of the cluster you want to manage.
- 3 Select the check box next to the resource whose load script you want to edit, then click the *Details* link.
- 4 Click the *Scripts* tab, then click the *Load Script* link.
The load script includes instructions and commands, all of which should currently be commented out with the # symbol.
- 5 Edit the NetStorage load script:
 - 5a Uncomment the following line by removing the # symbol:

```
#add secondary ipaddress A.B.C.D
```
 - 5b Replace A.B.C.D with the IP address you want to assign to the NetStorage resource.
For example, if the IP address for the NetStorage cluster resource is 192.168.1.10, the line in the load script would now appear as follows:

```
add secondary ipaddress 192.168.1.10
```

Clients can now use the NetStorage cluster resource IP address as part of the URL to access NetStorage instead of the NetStorage server's IP address or DNS name.

- 5c** Specify the *Load Script Timeout* value, then click *Apply* to save the script or, if you are creating a new cluster resource, click *Next*.

The timeout value determines how much time the script is given to complete. If the script does not complete within the specified time, the resource becomes comatose.

- 6** Edit the NetStorage unload script:

- 6a** Click *Unload Script* on the *Scripts* tab on the property page to edit the unload script.

If you are creating a new cluster resource, the unload script page should already be displayed. The unload script includes instructions and commands, all of which should currently be commented out with the # symbol.

- 6b** Uncomment the following line by removing the # symbol:

```
#del secondary ipaddress A.B.C.D
```

- 6c** Replace A.B.C.D with the IP address you want to assigned to the NetStorage resource in [Step 5b](#).

For example, if the IP address for the NetStorage cluster resource is 192.168.1.10, the line in the unload script would now appear as follows:

```
del secondary ipaddress 192.168.1.10
```

- 7** Continue with [Section 5.2.4, “Setting the NetStorage Resource Start, Failover, and Failback Modes,”](#) on page 28.

5.2.4 Setting the NetStorage Resource Start, Failover, and Failback Modes

The Generic IP Service resource template sets the NetStorage resource Start Mode and Failover Mode to AUTO, and the Failback Mode to DISABLE.

If the NetStorage resource Start Mode is set to AUTO, the resource automatically starts on a designated server when the cluster is first brought up (the secondary IP address specified in the resource is automatically added to the server). If the NetStorage resource Start Mode is set to MANUAL, you can manually start the resource on a specific server when you want, instead of having it automatically start when servers in the cluster are brought up.

If the NetStorage resource Failover Mode is set to AUTO, the NetStorage resource automatically moves to the next server in the Assigned Nodes list in the event of a hardware or software failure. If the NetStorage resource Failover Mode is set to MANUAL, you can intervene after a failure occurs and before the resource is started on another node.

If the NetStorage resource Failback Mode is set to DISABLE, the resource continues running on the node it has failed to. If the NetStorage resource Failback Mode is set to AUTO, the resource automatically moves back to its preferred node when the preferred node is brought back online. Set the NetStorage resource Failback Mode to MANUAL to prevent the resource from moving back to its preferred node when that node is brought back online, until you are ready to allow it to happen.

The preferred node is the first server in the Assigned Nodes list for the resource.

IMPORTANT: Resources fail back only to the first node in their Assigned Nodes list. For example, if a resource has failed over to three servers since it originally ran on its preferred node, and the second server the resource was running on comes back up, the resource does not fail back to that second server.

Resources do not automatically move from node to node just because a node higher in the Assigned Nodes list rejoins the cluster, unless the Failback mode is set to AUTO and the first node in the Assigned Nodes list rejoins the cluster.

If you are creating a new cluster resource, the Resource Policies page should already be displayed. You can start with [Step 5](#).

IMPORTANT: A cluster resource cannot be edited while it is loaded or running on a server. Make sure to offline the resource before attempting to modify its resource properties, policies, or scripts.

- 1 In iManager, click *Clusters*, then click *Cluster Options*.
- 2 Browse to locate and select the Cluster object of the cluster you want to manage.
- 3 Select the box next to the resource whose *Start*, *Failover*, or *Failback* modes you want to view or edit, then click the *Details* link.
- 4 Click the *Policies* tab.
- 5 (Conditional) Select the *Resource Follows Master* check box if you want to ensure that the resource runs only on the master node in the cluster.

If the master node in the cluster fails, the resource fails over to whichever node becomes the master.
- 6 (Conditional) Select the *Ignore Quorum* check box if you don't want the cluster-wide timeout period and node number limit enforced.

The quorum default values were set when you installed Novell Cluster Services. You can change the quorum default values by accessing the properties page for the Cluster object.

Selecting this box ensures that the resource is launched immediately on any server in the Assigned Nodes list as soon as any server in the list is brought online.
- 7 Specify the *Start*, *Failover*, and *Failback* modes for this resource.

The default for both *Start* and *Failover* modes is AUTO, and the default for *Failback* mode is DISABLE.
- 8 Continue with [“View or Edit NetStorage Resource Server Assignments” on page 29](#), or if you are creating a new cluster resource, click *Next*, then continue with [“Configuring NetStorage with Novell Cluster Services” on page 25](#).

5.2.5 View or Edit NetStorage Resource Server Assignments

A cluster resource cannot be edited while it is loaded or running on a server. Make sure to offline the resource before attempting to modify its resource properties, policies, or scripts.

The Generic IP Service resource template automatically assigns the NetStorage resource to all nodes in the cluster. The order of assignment is the order the nodes appear in the resource list. You should assign the NetStorage resource only to those servers in the cluster that have NetStorage installed.

If you are creating a new cluster resource, the Preferred Nodes page should already be displayed. If you are assigning nodes for an existing resource, the Preferred Nodes page is displayed as part of the Resource Policies page. You can start with [Step 5](#).

- 1 In iManager, click *Clusters*, then click *Cluster Options*.
- 2 Browse to locate and select the Cluster object of the cluster you want to manage.

- 3 Select the box next to the resource whose preferred node list you want to view or edit, then click the *Details* link.
- 4 Click the *Preferred Nodes* tab.
- 5 View the current NetStorage resource server assignments and, if necessary, click the right-arrow or left-arrow button to assign or unassign servers to the resource.

The *Assigned Nodes* list should contain only servers where you have installed and configured NetStorage.
- 6 View the order of the NetStorage resource server assignments and, if necessary, click the up-arrow and down-arrow buttons to change the preferred failover order of the servers assigned to the resource or volume.
- 7 Click *Apply* to save node assignment changes.

5.2.6 Accessing NetStorage After Cluster Configuration

To access NetStorage after configuring it with Novell Cluster Services, you should use the NetStorage cluster resource IP address as part of the URL to access NetStorage instead of the NetStorage server's IP address or DNS name. For more information on accessing NetStorage, see [Chapter 4, "Using NetStorage," on page 19](#).

Administering NetStorage

6

You can use Novell® iManager to change your NetStorage configuration after NetStorage has been installed on a NetWare® server (known as the Middle Tier or XTier server). NetStorage configuration information is stored in the NetWare registry and iManager provides an easy method for changing NetStorage registry entries. iManager requires Internet Explorer 5 or later.

If you are running in a clustered environment, any registry changes made to one node in the cluster must be made to the registry of each node in the cluster. After you have made a change to one node, run iManager on each node in the cluster and make the same changes. For more information about running NetStorage in a clustered environment, see “[Configuring NetStorage with Novell Cluster Services](#)” in the *Novell Cluster Services Resource Configuration Guide*.

IMPORTANT: After changing any settings, you must reboot your NetWare server or restart the Apache Web server. At the server console, enter `Ap2WebDn` to stop the Web server and then enter `Ap2WebUp` to restart the Web server.

- ♦ [Section 6.1, “Using iManager to Administer NetStorage,” on page 31](#)
- ♦ [Section 6.2, “Understanding the NetStorage Configuration Settings,” on page 32](#)
- ♦ [Section 6.3, “What's Next,” on page 40](#)

6.1 Using iManager to Administer NetStorage

- 1 Start your Internet browser and enter the URL for iManager.

The URL is `http://server_ip_address/nps/imanager.html`. Replace *server_ip_address* with the IP address or DNS name of the NetWare 6.5 server running NetStorage or the IP address for Apache-based services.

The date and time on the workstation being used to access NetStorage should be (within a few hours) of the date and time on the server running NetStorage to avoid conflicts.

- 2 Enter your username and password.
- 3 In the left column, locate the *File Access (NetStorage)* configuration options you want to change.

iManager displays a list of links in the left column that are used to access the various pages for editing and viewing NetStorage configuration information in the NetWare registry. For more information on each setting, click *Help* or see [Section 6.2, “Understanding the NetStorage Configuration Settings,” on page 32](#).

- 4 Make the necessary configuration changes.
- 5 (Conditional) If you are running in a clustered environment, run iManager on each node in the cluster and make the same changes.

For more information about running NetStorage in a clustered environment, see the “[Configuring NetStorage with Novell Cluster Services](#)” in the *Novell Cluster Services Resource Configuration Guide*.

6.2 Understanding the NetStorage Configuration Settings

This section includes information on all configuration settings that can be set. The settings are organized according to the link in the left column that they appear under. This information is also available if you click *Help*.

- ♦ [“Authentication Domains” on page 32](#)
- ♦ [“Current Sessions” on page 33](#)
- ♦ [“Files” on page 33](#)
- ♦ [Section 6.2.4, “iFolder Storage Provider,” on page 34](#)
- ♦ [Section 6.2.5, “NetWare Storage Provider,” on page 34](#)
- ♦ [“NetStorage Options” on page 36](#)
- ♦ [“NetStorage Statistics” on page 37](#)
- ♦ [“Resource Usage” on page 37](#)
- ♦ [Section 6.2.9, “WebDAV Provider,” on page 37](#)
- ♦ [“Storage Location” on page 37](#)

6.2.1 Authentication Domains

Lets you change or add the Novell eDirectory™ server URLs and contexts that are required by NetStorage. This page also lets you add support for dotted usernames, e-mail address names, and Universal passwords, as well as giving you the option to change the eDirectory server that is designated as the Primary. See [Section 3.2, “Installing Novell NetStorage During the NetWare 6.5 Installation,” on page 15](#) for more information about eDirectory server URLs and contexts.

Table 6-1 *Authentication Settings and Description*

Settings	Description
Dotted Names	<p>Allows the use of a dot in a username. Some usernames contain dots (for example: john.doe). Enabling this option allows usernames containing dots to authenticate through NetStorage.</p> <p>If this option is disabled, usernames containing dots can still authenticate through NetStorage by adding a forward slash (/) in front of the dot in the username (for example: john/.doe).</p>
eMail Address Names	<p>Allows the use of the At symbol (@) in a username. Some usernames are e-mail address names and contain the At symbol. Enabling this option allows usernames containing this character to authenticate through NetStorage. If this option is disabled, NetStorage reads the username up to the At symbol and then tries to authenticate with that much of the name.</p>

Settings	Description
Universal Password	<p>Allows universal passwords to be used for NetStorage authentication.</p> <p>Universal password functionality is disabled by default. If you have enabled universal passwords, enabled this option to let users with universal passwords authenticate through NetStorage.</p> <p>If universal passwords have not been configured and enabled, selecting this option has no effect. NetStorage uses whatever password type is configured.</p> <p>See <i>“Deploying Universal Passwords”</i> (http://www.novell.com/documentation/nmas23/index.html?page=/documentation/nmas23/admin/data/allq21t.html) for information on configuring universal passwords.</p>
Add Domain	Adds another eDirectory server IP address or DNS name. Users are authenticated to this eDirectory server.
Make Primary	Makes the eDirectory server URL listed above the button the Primary.
Remove Domain	Removes the eDirectory server URL from the list of URLs used by NetStorage.
Add Context	Adds a context that NetStorage searches when authenticating users. Use periods to separate the context. For example, ou=users.o=digitalair. If the user is not located in the first context, any additional contexts added here is searched. If the user is not found in any context listed, an LDAP search of all subdirectories is performed. If clear-text passwords are not enabled on the server, this search fails.
Remove Context	Removes the context (if there is one) from the eDirectory server URL.
Add Host	<p>Lets you list additional hosts for an Authentication Domain. Clicking the <i>Add Hosts</i> button lets you create a list of alternative hosts for the domain.</p> <p>If the Middle Tier server cannot reach the host specified in the domain, it searches the <i>Other Hosts</i> list specified in the <i>Value</i> field to find another server to use for authentication. Specify DNS names or IP addresses of alternate servers, separated by a comma delimiter, in the <i>Value</i> field.</p> <p>For example, you could enter a string similar to the following:</p> <pre>Middletier.boston.digitalair.com,Middletier1.boston.digitalair.com</pre> <p>or</p> <pre>111.22.33.4,111.22.33.41</pre>

6.2.2 Current Sessions

Displays a report with information on the current NetStorage sessions.

6.2.3 Files

Displays the NetStorage Web page. This provides a way to access NetStorage from iManager, without entering the NetStorage URL. See [Chapter 4, “Using NetStorage,” on page 19](#) for more information on the NetStorage Web page.

6.2.4 iFolder Storage Provider

If you have Novell iFolder[®] 2.x installed on your NetWare server, you can view or edit the following iFolder-specific configuration settings.

Table 6-2 iFolder Configuration Settings and Description

Settings	Description
Root	The name of the root directory for iFolder. The root iFolder directory is a virtual directory, and changing it changes the iFolder directory name users see when accessing their files and directories on the iFolder server. The default is iFolder.
Passphrase Form Protocol	The default is HTTPS. This field should not be changed unless you want users' passphrases to be sent in clear text.
iFolder Server	<p>The DNS name and port number for the iFolder 2.x server. This setting shouldn't need to be changed unless you are changing the iFolder server your users will access.</p> <p>If you click the <i>Set Defaults</i> button, the value is set to whatever value appears in the <i>Default Value</i> column. If there is no value in the <i>Default Value</i> column, the value is set to blank (no value).</p>
Secure Port	The port number that HTTPS is running on. This setting normally does not need to be changed. The default is 443.

6.2.5 NetWare Storage Provider

NOTE: The name fields should not contain any special characters that are misinterpreted as separators in any type of path or URL string. The characters includes /, \, and : and you must not use them in the name fields in the configuration section.

Table 6-3 NetWare Storage Provider Settings and Description

Settings	Description
Home Name	<p>This text is displayed on the NetStorage Web page and is followed by the tree name and path to the user's home directory. The user might have home directories in multiple trees, in which case multiple paths are displayed.</p> <p>The default is Home@. You might want to change this if you want to reference home directories with a different word or in a language other than English. See the Alternate Tree Name listing below for more information on configuring NetStorage to display multiple home directories.</p>
Drive Name	This text is displayed on the NetStorage Web page and includes the drive letter being referenced, followed by the path to the mapped drive. The user's login script on the Primary tree is parsed by NetStorage to gather information on mapped drives. You might want to change this if you want to use a different word or words to reference mapped drives on the NetStorage Web page.

Settings	Description
Public Directory Name	<p>This registry key provides a way for any NetStorage user to make documents or files available to other NetStorage users.</p> <p>A public directory can be automatically created in each user's home directory by NetStorage. If public directories are created by NetStorage, all users in the same eDirectory context have Read and File Scan rights to the other users' public directories.</p> <p>If you don't want public directories created in users' home directories, leave this field blank (the default).</p> <p>If you want public directories created in users' home directories, specify the name for the public directories. For example, if you specify My Public Files as the name for the public directories, a folder named My Public Files is created at the root of each user's home directory the first time the user logs in through NetStorage.</p> <p>To access a public directory, users need to add <i>~username</i> at the end of the URL used to access NetStorage. For example if you want to access the public directory for a user named jsmith, you might specify a URL similar to <code>http://file.i-login.net/oneNet/NetStorage/~jsmith</code>.</p>
Alternate Tree Name	<p>When a user's home directory is displayed by NetStorage, the name of the eDirectory tree is also displayed. With this configuration field, you can change the tree name that users see in NetStorage to something that might be more intuitive. For example, if the tree name is SERVICES 2 and you want users to see i-Login, you would type <code>SERVICES2/i-Login</code> in this configuration field. The eDirectory tree name and the substitute name are separated with a slash (/).</p> <p>NetStorage can access user home directories in multiple eDirectory trees. If you want to substitute eDirectory tree names in more than one tree, separate those tree name substitutions with a comma. An example of this is <code>SERVICES2/i-Login,SERVEME2/Staging</code>.</p>
Container Search Height	<p>Specifies the number of container levels (from where the User object is located) that NetStorage searches up in the eDirectory tree for the container login script. The default is 1, which is the same level used by Novell Client™ software.</p> <p>If you specify a number greater than the number of container levels in the eDirectory tree, NetStorage searches up to and including the root container in the tree. If you specify 0, NetStorage only searches the container where the User object is located.</p>
Home Dirs	<p>Specifies if home directories are to be processed. The default is 1, meaning that they are processed. If you specify 0, no home directories are processed or displayed to the user.</p>
Check MAP Drives	<p>Specifies if mapped drives (from login script MAP statements) are checked when the user logs in. The default is 0, meaning that mapped drives are not checked and all mapped drives are displayed to the user. If the user attempts to access a mapped drive pointing to a directory that does not exist or that the user does not have access rights to, an error occurs.</p> <p>If you specify 1, each mapped drive is checked at login and map drives that do not exist or that the user does not have access to are not displayed.</p>

6.2.6 NetStorage Options

Table 6-4 *NetStorage Settings and Description*

Settings	Description
Proxy Username and Proxy Password	<p>The admin username and password that you entered when you installed your NetWare server. If you want the Middle Tier Server to use a different username and password for administrator access, specify them in the fields provided.</p> <p>If you click the <i>Set Defaults</i> button, the value is set to whatever value appears in the <i>Default Value</i> column. If there is no value in the <i>Default Value</i> column, the value is set to blank (no value).</p>
Location	<p>The registered location you want users to enter as part of the NetStorage URL to access NetStorage. The default is oneNet.</p> <p>If you change this registry setting, you must also edit the <code>netstorage\xsrv.conf</code> file and change the <code>/oneNet</code> setting in the <code>Location</code> section (first section) to the same setting you specified in iManager.</p>
Session Timeout	<p>The amount of time (in seconds) that the session remains idle before it is terminated. If there is no NetStorage activity for this amount of time, the user is required to log in again to NetStorage before being allowed file access.</p>
Janitorial Level	<p>This setting should not be changed except under direction from Novell.</p>
Persistent Cookies	<p>This setting can be turned on or off. With the value set to 0, Persistent Cookies is turned off (the default) if there is no value or if the value is set to 0.</p> <p>With Persistent Cookies turned off, the NetStorage session ends when the user closes the current browser or Web folder. Also, if the user has a current instance of NetStorage running in a browser window or Web folder and starts up a new browser instance or Web folder, the user is required to reauthenticate.</p> <p>Turning off Persistent Cookies can be beneficial if you have workstations that are shared, because as long as the browser instance is closed down, the next user of the workstation cannot accidentally or intentionally obtain access to your network through NetStorage.</p> <p>Leaving Persistent Cookies turned on can be beneficial if your workstations are not shared because users are not required to unnecessarily re-authenticate.</p> <p>If the user selects the <i>Logout</i> option in NetStorage, the session ends regardless of whether Persistent Cookies is turned on or off.</p>
LDAP Port	<p>Lets you change the LDAP port number if there is a conflict between Active Directory* and eDirectory for LDAP requests.</p> <p>This conflict exists because the back end is acting as a domain controller that has Active Directory installed on it. The conflict is created by both eDirectory and Active Directory attempting to use the same default port (number 389). Active Directory normally wins the conflict. The Proxy User object type exists in eDirectory but not in Active Directory. Because of this, when the Middle Tier server tries to bind as a Proxy User, the bind attempt fails. This is also the reason LDAP lookups fail.</p>

Settings	Description
Cookieless	<p>The <i>Cookieless</i> option can be turned either on or off. With the value set to 0, cookieless authentication is turned off (the default). Cookieless authentication can be turned on by setting the value to 1.</p> <p>Cookieless authentication is needed for some clients that use versions of WebDAV that don't support cookies. For example, Apple* clients use a WebDAV version that does not support cookies.</p> <p>If cookieless authentication is turned on, you must close all browser instances to logout.</p>

6.2.7 NetStorage Statistics

Displays a report with information about server up time, login failures, number of NetStorage sessions, etc.

6.2.8 Resource Usage

Displays a detailed report of resource utilization for NetStorage.

6.2.9 WebDAV Provider

Table 6-5 *WebDAV Provider Settings and Description*

Settings	Description
Monkier	The location of the NetStorage WebDAV provider (<code>xdav.nlm</code>). It is the location you want users to specify as part of the NetStorage URL to access NetStorage. The default is NetStorage.
Template Directory	The directory for the HTML interface. This setting should not be changed except under direction from Novell.

6.2.10 Storage Location

You can create a Storage Location object to display a specified name for a network directory in the NetStorage directory access list displayed through Microsoft Web Folders or a Web browser. Creating a Storage Location object is useful if users expect the directory to have a certain name. Unlike directories that are displayed from a login script, Home directory, or iFolder that have a name that cannot be altered, you can specify the Storage Location object name.

After you have created a Storage Location object, you must associate this object with a User, Group, Location, or Container object. Users see the directory associated with the object the next time they log in.

- ♦ [“Creating a Storage Location Object” on page 38](#)
- ♦ [“Creating or Modifying a Storage Location List” on page 38](#)
- ♦ [“Modifying a Storage Location Object” on page 39](#)
- ♦ [“Deleting a Storage Location Object” on page 39](#)

Creating a Storage Location Object

- 1 Start your browser (Internet Explorer 5 or later, Mozilla, etc.) and specify the URL for iManager.

The URL is `http://server_ip_address/nps/manager.html`. Replace *server_ip_address* with the IP address or DNS name of the NetWare 6.5 server running NetStorage or the IP address for Apache-based services.

- 2 Type your username and password.
- 3 In the left column, click *File Access*, then click *New Storage Location*.
- 4 Specify the object name, display name, display location, context, and a comment.

The object name is the name of the object in the eDirectory tree.

The display name is the name to be displayed in the NetStorage directory access list. This is the shortcut name and is seen by users. If you use the same display name for two different Storage objects, a digit is added to the names to make each name unique.

The directory location is the location of the directory on the file system. The location is a URL that includes the file system type, server name, volume, and directory path and it must be in the following format:

`ncp://server_name/volume/path_to_directory`

For example:

`ncp://server1.digitalair.com/mktg/reports`

or

`ncp://111.222.3.4/mktg/reports`

If the file system is omitted, it is assumed that it is NCP™.

The context is the directory context that the Storage Location object resides in. Click the object selector to select the context.

The comment is entered by the administrator and is not displayed to users.

- 5 Click *Create*, then click *OK*.

Creating or Modifying a Storage Location List

After you create a Storage Location object, you must create a list of Storage Location objects that can be used with a specified User, Group, Profile, or Container object. Users see the directory associated with the object the next time they log in. After this list is created, you can modify it from the same window by assigning additional Storage Location objects to the list or by deleting Storage Location objects from the list.

- 1 Start your browser (Internet Explorer 5 or later, Mozilla, etc.) and specify the URL for iManager.

The URL is `http://server_ip_address/nps/manager.html`. Replace *server_ip_address* with the IP address or DNS name of the NetWare 6.5 server running NetStorage or the IP address for Apache-based services.

- 2 Type your username and password.
- 3 In the left column, click *File Access*, then click *Assign Storage Location to Object*.
- 4 Click the *Object Selector* button; select the User, Group, Profile, or Container object that the list is to be created for; then click *OK*.

IMPORTANT: If you enter an invalid object name in the *Object* field and click *OK*, you are directed back to the Home page instead of being taken to the next page.

- 5 Click the *Object Selector* button, select the Storage Location objects you want included in this list, then click *OK*.

You can select multiple Storage Location objects in the Object Selector window. When you select multiple Storage Location objects, they appear in the *Selected Objects* list. If the list already contains Storage Location objects and you want to add more, ensure that the original objects are still in the list before clicking *OK*.

- 6 (Optional) Remove existing storage locations by deleting their names from the list.
- 7 When you are finished creating or modifying the list, click *OK*.

Modifying a Storage Location Object

- 1 Start your browser (Internet Explorer 5 or later, Mozilla, etc.) and specify the URL for iManager.

The URL is `http://server_ip_address/nps/imanager.html`. Replace *server_ip_address* with the IP address or DNS name of the NetWare 6.5 server running NetStorage or the IP address for Apache-based services.

- 2 Type your username and password.
- 3 In the left column, click *File Access*, then click *Edit Storage Location*.
- 4 Click the *Object Selector*, then select the Storage Location object that you want to modify.
- 5 Modify the display name, display location, or comment, then click *OK*.

If you need to modify the object name or eDirectory context, you must delete this object and create a new Storage Location object.

- 6 Click *OK*.

IMPORTANT: If the IP address of the server which is represented in the eDirectory storage location object is changed, you must update the storage location object with the new IP address. You do need to change any configuration files.

Deleting a Storage Location Object

- 1 Start your browser (Internet Explorer 5 or later, Mozilla, etc.) and specify the URL for iManager.

The URL is `http://server_ip_address/nps/imanager.html`. Replace *server_ip_address* with the IP address or DNS name of the NetWare 6.5 server running NetStorage or the IP address for Apache-based services.

- 2 Type your username and password.
- 3 In the left column, click *File Access*, then click *Delete Storage Location*.
- 4 Click the *Object Selector* button, then select the Storage Location object that you want to delete.
- 5 Click *OK*.

6.3 What's Next

After you have configured NetStorage, inform users that they can access their files from the Web. Instructions for accessing files through NetStorage are available in [Chapter 4, “Using NetStorage,”](#) on page 19.

Troubleshooting NetStorage

7

This section contains information on common troubleshooting issues. In addition to this information, additional information is located in Technical Information Documents (TIDs) available in the Knowledgebase on the [Novell® Support Web site \(http://support.novell.com\)](http://support.novell.com).

- ♦ [Section 7.1, “Unexpected Results from Login Scripts,” on page 41](#)
- ♦ [Section 7.2, “Logging In As a Different User,” on page 41](#)
- ♦ [Section 7.3, “Slow Login,” on page 42](#)
- ♦ [Section 7.4, “Configuring LDAP Contextless Login for use with NetStorage,” on page 42](#)
- ♦ [Section 7.5, “Novell iFolder 2.x and NetStorage,” on page 43](#)
- ♦ [Section 7.6, “Character Set Issues with Netscape,” on page 43](#)
- ♦ [Section 7.7, “Configuring NetStorage With iChain,” on page 43](#)
- ♦ [Section 7.8, “Phantom Folders,” on page 44](#)

7.1 Unexpected Results from Login Scripts

When a user authenticates to NetStorage, the login scripts associated with the Novell eDirectory™ User object in the primary authentication domain are processed. These login scripts are the same scripts processed by the Novell Client™.

However, because login scripts were designed to be processed by the Novell Client on the user's workstation, some of the defined statement types and script variables cannot be processed by NetStorage.

Specific information about how login scripts interacts with NetStorage is available in “[Login Script Processing by NetStorage](http://support.novell.com/cgi-bin/search/searchtid.cgi?/10068983.htm)” TID10068983 (<http://support.novell.com/cgi-bin/search/searchtid.cgi?/10068983.htm>).

The maximum size of a login script is 16 KB. If the 16 KB limit is exceeded, login script drive mappings will fail.

7.2 Logging In As a Different User

If you are using Windows 98 and Internet Explorer and, after logging in to NetStorage you intend to log in again as a different user, you must first delete Internet Explorer cookies and log out from Windows 98 or you cannot log in again. This is necessary because Windows 98 retains user information and NetStorage cookies are user-specific.

When using Windows 2000 and Microsoft Web Folders, you must enable the Launch Folder Windows in a Separate Process option:

- 1 Double-click *My Computer*, then click *Tools > Folder Options > View*.
- 2 Check the *Launch Folder Windows in a Separate Process* check box.

For all versions of Windows and Internet Explorer, configure Internet Explorer to prompt for the username and password:

- 1 Click *Tools > Internet Options > Security > Custom Level*.
- 2 In the User Authentication Setting section, click *Prompt for Username and Password > OK > OK*.

7.3 Slow Login

The most common cause of a slow login to NetStorage is large or poorly configured login scripts. When a user authenticates to the Primary Authentication domain, all applicable login scripts for that user object are processed. The more commands executed, the longer the login process.

Invalid authentication domains can also slow the login process. After the user has been authenticated to the Primary authentication domain, the same username and password is used to authenticate to any Secondary authentication domains. Authentication failure on any of these domains slows logins. Users can successfully authenticate to the Primary Authentication domain but fail at each of the secondary domains.

It is helpful to determine if slow logins are global (all users) or specific to a given user object. If all users are affected, it is more likely to be a problem with the XTier authentication domain configuration. If a single user or groups of users are affected, check all login scripts that apply to that user or group. A problem with a context's login script can affect a large number of users. Finding out which scripts apply to which users can help narrow the problem.

For more information on how NetStorage works with login scripts, see "[Login Script Processing by NetStorage](http://support.novell.com/cgi-bin/search/searchtid.cgi?/10068983.htm)" TID10068983 (<http://support.novell.com/cgi-bin/search/searchtid.cgi?/10068983.htm>)".

7.4 Configuring LDAP Contextless Login for use with NetStorage

When configuring LDAP contextless login, consider the following issues:

Primary Authentication Domain: The user must be authenticated to the Primary Authentication domain (an eDirectory server with a replica). You can provide more than one context in the Primary Authentication domain, resulting in each context being searched for the presence of the user. The search is performed through an LDAP search of the configured contexts.

Secondary Authentication Domain: After the user is authenticated to the Primary authentication domain, the same username and password are used to authenticate to any Secondary authentication domains. The search is performed through an LDAP search of the configured contexts for that domain. If authentication to any Secondary domains is unsuccessful, the user is still authenticated to the Primary authentication domain. Authentication failure on a Secondary domain can cause a delay in the login process and is one of the most common causes of slow logins to NetStorage.

Enable TLS for Simple Binds with Passwords: Passwords are encrypted in NetWare 6.5, so you must enable TLS for simple binds with passwords in LDAP.

LDAP needs read and browse rights to the entire tree. By default, when a user performs an anonymous bind (doesn't specify a password), a special object in the directory calculates access control for that user. This object is termed [Public]. By default, this object can browse the entire tree hierarchy and read a limited number of attributes on entries.

If you'd like to have an anonymous bind use a different object in the tree, you can specify the object in the *Proxy Username* field. By doing this, you can restrict the types of objects and attributes that anonymous users can access by setting the appropriate access controls on the proxy user object. The proxy username must be a distinguished name. To easily select an object, click the directory browser button to the right of the text field on the LDAP Group Object. A dialog box appears that allows you to choose an object in the tree. Any eDirectory user object can be used and the anonymous access assumes the rights of that user.

IMPORTANT: A proxy user must have a blank password in order to work correctly. This is very different from having no password. If a user has no password, then e or she does not have a public/private key pair to compare against when attempting login. A blank password generates a public/private key pair, although the actual string for the password is empty.

7.5 Novell iFolder 2.x and NetStorage

When troubleshooting a NetStorage and Novell iFolder® issue, it is important to first determine if it is a NetStorage problem or an iFolder problem. It is easy to spend a great deal of time working the problem from the NetStorage end only to find that the user cannot access iFolder directly. A few simple tips can help speed the identification of the problem.

IMPORTANT: It is not currently possible to access iFolder 3.x by using NetStorage.

- ♦ Take NetStorage out of the equation. Make sure the User can successfully log into iFolder with the iFolder client or applet. If login is unsuccessful, the problem is with iFolder and should be addressed there. If the user successfully logs in to iFolder, begin troubleshooting the NetStorage application.
- ♦ Enable debugging for the iFolder Storage Provider. In iManager, click iFolder Storage Provider and change the Debug Level from 0 (default) to FFFFFFFF, then restart the server. Log in to NetStorage and attempt to access iFolder. The server logger screen now displays all warnings and errors related to the iFolder Provider.
- ♦ Create a new user for testing. Some problems are user-specific and some problems affect all users. Creating a test user can help to determine this. When you create a test user for troubleshooting, login scripts and home directories are not needed.

7.6 Character Set Issues with Netscape

If you use the Netscape browser to open NetStorage, square boxes are displayed in place of some characters. To resolve this, click *View > Character Set > Unicode (UTF-8)*, then click *View > Character Set > Set Default Character Set*.

7.7 Configuring NetStorage With iChain

If you are configuring NetStorage to run behind a Novell iChain® server (fronting NetStorage with iChain), there are some configuration changes required in order for NetStorage to function properly. These configuration changes include enabling cookieless authentication and editing the `logout.html.utf8` file.

- ♦ [Section 7.7.1, “Enabling Cookieless Authentication,” on page 44](#)
- ♦ [Section 7.7.2, “Editing the logout.html.utf8 File,” on page 44](#)

7.7.1 Enabling Cookieless Authentication

- 1 Start your browser (Internet Explorer 5 or later, Mozilla, etc.) and specify the URL for iManager.

The URL is `http://server_ip_address/nps/imanager.html`. Replace *server_ip_address* with the IP address or DNS name of the NetWare server running NetStorage or the IP address for Apache-based services.

- 2 Type your username and password.
- 3 In the left column, click *File Access*, then click *NetStorage Options*.
- 4 Set the value for the *Cookieless* option to 1.

The *Cookieless* option can be turned either on or off. With the value set to 0, cookieless authentication is turned off (the default). Cookieless authentication can be turned on by setting the value to 1.

If cookieless authentication is turned on, you must close all browser instances to log out.

7.7.2 Editing the `logout.html.utf8` File

The `logout.html.utf8` file is located in the `sys:/tomcat/4/webapps/NetStorage` directory on the NetWare server where NetStorage is installed. Edit the file and replace `<iChainDNS>` with the DNS name of the iChain server. To enable iChain logout, some lines must be uncommented and others must be removed. There are instructions in the file on which lines to remove and uncomment.

7.8 Phantom Folders

There might be a phantom folder that appears with some uses of Microsoft WEBDAV. The phantom folder has a different icon than normal folders, and should be ignored.

A phantom folder usually appears when using My Network Places on a Windows client. My Network Places uses Microsoft's WebDAV client, which assumes that the directory name returned means that there is also a subdirectory with the same name.

Security Considerations

A

This section contains specific instructions on how to configure Novell® NetStorage in the most secure way possible. It contains the following subsections:

- ♦ [Section A.1, “Security Features,” on page 45](#)
- ♦ [Section A.2, “Security Configuration,” on page 46](#)
- ♦ [Section A.3, “Security Recommendations,” on page 47](#)
- ♦ [Section A.4, “Other Security Considerations,” on page 49](#)

A.1 Security Features

The following table contains a summary of the security features of NetStorage:

Table A-1 *NetStorage Security Features*

Feature	Yes/No	Details
Users are authenticated	Yes	Administrative users are authenticated via eDirectory™.
Users are authorized	Yes	Users are authorized via eDirectory trustees.
Access to configuration information is controlled	Yes	Access to the administrative interface is restricted to valid users that have write rights to the configuration files.
Roles are used to control access	Yes	Configurable through iManager
Logging and/or security auditing is done	Yes	Syslog on Linux. On NetWare®, messages go on the logger screen. XTier has its own logging mechanism on all platforms. XTlog is also used.
Data on the wire is encrypted by default	Yes	Data is encrypted on the wire if SSL is used. If SSL is not used, NetIdentity can be used to provide secure authentication.
Stored data is encrypted	No	
Passwords, keys, and any other authentication materials are stored encrypted	Yes	Username and passwords are encrypted. NetStorage configuration is encrypted in eDirectory.
Security is on by default	Yes	This is a Web server setting, which can be turned on or off at the Web server.

A.2 Security Configuration

The following subsections provide a summary of security-related configuration settings for NetStorage:

- [Section A.2.1, “NetStorage Configuration Settings,” on page 46](#)
- [Section A.2.2, “Security Information for Other Products,” on page 46](#)

A.2.1 NetStorage Configuration Settings

The following table lists the NetStorage configuration settings that are security related or that impact the security of NetStorage:

Table A-2 NetStorage Security Configuration Settings

Configuration Setting	Possible Values	Default Value	Recommended Value for Best Security
Session Timeout	Time in seconds		
Persistent Cookies	0, 1	0	0 (Disabled)
Cookieless Authentication	0, 1	0	0 (Disabled)
Secure Port (iFolder)		443	443

A.2.2 Security Information for Other Products

The following table provides links to security-related information for other products that impact the security of NetStorage:

Table A-3 Security Information for Other Products

Product Name	Links to Security Information
NSS	Securing Access to NSS Volumes, Directories, and Files (http://www.novell.com/documentation/oes2/stor_nss_lx_nw/data/bv8n39l.html) . and Security Considerations (http://www.novell.com/documentation/oes2/stor_nss_lx_nw/data/bx8gp06.html) .
eDirectory	Security for eDirectory is provided by NCI. See the NICI 2.7x Administration Guide (http://www.novell.com/documentation/nici27x/nici_admin_guide/data/a20gkue.html)

Product Name	Links to Security Information
Novell Client™	<p>Security Considerations (http://www.novell.com/documentation/linux_client/linuxclient12/data/bu0ossa.html#bu0ossa) in the <i>Novell Client for Linux Administration Guide</i>.</p> <p>and</p> <p>Managing File Security and Passwords (http://www.novell.com/documentation/noclienu/noclienu/data/h9nmmvwn.html#h9nmmvwn) in the <i>Novell Client for Windows Installation and Administration Guide</i>.</p>
Samba	<p>See Security Implications (http://www.novell.com/documentation/oes2/file_samba_cifs_lx/index.html?page=/documentation/oes2/file_samba_cifs_lx/data/bookinfo.html#bookinfo) in the <i>Samba Administration Guide for OES Linux</i>.</p>
Novell Password Management	<p><i>Novell Password Management Administration Guide</i> (http://www.novell.com/documentation/password_management31/treetitl.html)</p>

A.3 Security Recommendations

The following subsections provide a summary of security-related recommendations for NetStorage:

- ♦ Section A.3.1, “Registry Access Control,” on page 47
- ♦ Section A.3.2, “Use NMAS,” on page 48
- ♦ Section A.3.3, “Use SSL With Your Web Server,” on page 48
- ♦ Section A.3.4, “Persistent and Session Cookies,” on page 48
- ♦ Section A.3.5, “Use Web Server Logs,” on page 48
- ♦ Section A.3.6, “Use XTLog,” on page 48
- ♦ Section A.3.7, “Denial of Service Attacks,” on page 49
- ♦ Section A.3.8, “Trusted Roots in CAPI,” on page 49
- ♦ Section A.3.9, “Certificate Validation Registry Setting,” on page 49

A.3.1 Registry Access Control

Access control to the registry is enforced by the operating system.

On Windows (any version), each branch of the registry can have its own ACL (access control list). Windows checks to see if the calling thread has permissions to read/write/modify the registry entry being accessed, and returns status appropriately.

On NetWare, local access to the registry is a trusted operation, and any NLM™ running on the server is allowed access.

On Linux, XTier has implemented its own registry based on XFLAIM, and access to this database is via UNIX domain sockets. Only XTier's registry user (novlxregd) and group (novlxtier) have access to these domain sockets, and access control is enforced via file system permissions. For any process to access the registry, the user associated with the process must be a member of the novlxtier group. Adding a user to a group is a privileged operation, and can be done only by an administrator.

WARNING: Do not store security-sensitive information in the registry. Sensitive information such as passwords should not be stored in the registry unless it is protected by strong encryption.

A.3.2 Use NMAS

NMAS™ login is designed to be more secure than NDS4. You should enable NMAS login for eDirectory users and enable the corresponding setting in NetStorage.

A.3.3 Use SSL With Your Web Server

Without SSL, all traffic to the Web server from the client, browser, or WebDAV client is in the clear. This allows anyone to snoop the traffic and look at all the data, including the data for authentication. This applies when the Basic authentication scheme is used. Using SSL provides privacy for all data traffic between the workstation/client and the Web server.

A.3.4 Persistent and Session Cookies

Session cookies are valid only for the duration of the browser/client session. After the windows of the browser are closed, these cookies are discarded by the browser, and a new instance of the browser has no knowledge of previously set session cookies.

Persistent cookies have an expiration date/time, and are valid until then. Persistent cookies are stored in persistent storage (usually the file system), so that newer instances of the browser can pick them up.

For more information about cookies, see [Persistent Client State HTTP Cookies \(http://wp.netscape.com/newsref/std/cookie_spec.html\)](http://wp.netscape.com/newsref/std/cookie_spec.html).

A.3.5 Use Web Server Logs

You should check Web server logs frequently for security-related information.

A.3.6 Use XTLog

See [Enable Debug Logging in IDM 6.5 and 7 \(http://www.novell.com/support/search.do?cmd=displayKC&docType=kc&externalId=3112868&sliceId=SAL_Public&dialogID=36914517&stateId=1%200%202640049\)](http://www.novell.com/support/search.do?cmd=displayKC&docType=kc&externalId=3112868&sliceId=SAL_Public&dialogID=36914517&stateId=1%200%202640049) for information on how and when to use XTLog.

Although the information refers to the ZENworks® Middle Tier Server, it also applies to other XTier applications such as NetStorage.

A.3.7 Denial of Service Attacks

Application developers should be aware of the possibility of denial of service attacks. This is true for any Web-based application. For example, if a DoS attack can be mounted on Apache or IIS, any XTier-web application is affected, because XTier-web runs as a module (or extension) of Apache and IIS.

A.3.8 Trusted Roots in CAPI

For instructions on setting up trusted roots in CAPI, see [Trusted Root Certification Authority Policy \(http://www.microsoft.com/resources/documentation/windows/xp/all/proddocs/en-us/sag_pkpusecertroot.mspx?mfr=true\)](http://www.microsoft.com/resources/documentation/windows/xp/all/proddocs/en-us/sag_pkpusecertroot.mspx?mfr=true).

A.3.9 Certificate Validation Registry Setting

If you are using NetIdentity, do not use the registry setting that allows a connection without certificate validation. The NetIdentity client places a registry setting on the client workstation. For more information see [Setting Up NetIdentity Authentication \(http://www.novell.com/documentation/zenworks7/dm7install/index.html?page=/documentation/zenworks7/dm7install/data/ahi6dan.html\)](http://www.novell.com/documentation/zenworks7/dm7install/index.html?page=/documentation/zenworks7/dm7install/data/ahi6dan.html) in the *Novell ZENworks 7 Desktop Management Installation Guide*.

A.4 Other Security Considerations

- ♦ Servers should be kept in a physically secure location with access by authorized personnel only.
- ♦ The corporate network should be physically secured against eavesdropping or packet sniffing. Any packets associated with the administration of NetStorage should have the highest security.
- ♦ Access to NetStorage configuration settings and logs should be restricted. This includes file system access rights, FTP access, access via Web utilities, SSH, and any other type of access to these files.
- ♦ When NetStorage is administered by users outside of the corporate firewall, the HTTPS protocol should be used. A VPN should also be employed.
- ♦ If a server is accessible from outside the corporate network, a local server firewall should be employed to prevent direct access by a would-be intruder.
- ♦ Log files should be kept and analyzed periodically.

Documentation Updates

B

This *NetStorage Administration Guide for NetWare* has been updated with the following information:

B.1 November 9, 2009

This guide has been modified for publication on the NetWare 6.5 SP8 Documentation Web site.

B.2 October 2008 (NetWare 6.5 SP8)

Location	Change
Section 6.2.5, "NetWare Storage Provider," on page 34	Added a note to clarify that the name fields should not contain any special characters that are misinterpreted as separators in any type of path or URL string.

B.3 October 25, 2006 (NetWare 6.5 SP6)

Location	Change
Chapter 4, "Using NetStorage," on page 19	Additional information has been added to clarify the supported URLs for accessing netstorage.

