

Novell iSCSI Initiator for NetWare®

1.1.3

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ADMINISTRATION GUIDE for NetWare 5.1 and NetWare 6

January 2005



Novell®

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About This Guide

This guide describes how to install and configure Novell® NetWare® iSCSI initiator. For information on installing and configuring NetWare iSCSI target software, see the [iSCSI 1.1.3 Administration Guide for NetWare 6.5](#). The guide is intended for network administrators and is divided into the following sections:

- ♦ [Chapter 1, “Overview,” on page 9](#)
- ♦ [Chapter 2, “Installation, Configuration, and Management,” on page 13](#)

Documentation Conventions

In this documentation, a greater-than symbol (>) is used to separate actions within a step and items in a cross-reference path.

A trademark symbol (®, ™, etc.) denotes a Novell trademark. An asterisk (*) denotes a third-party trademark.

When a single pathname can be written with a backslash for some platforms or a forward slash for other platforms, the pathname is presented with a backslash. Users of platforms that require a forward slash, such as UNIX*, should use forward slashes as required by your software.

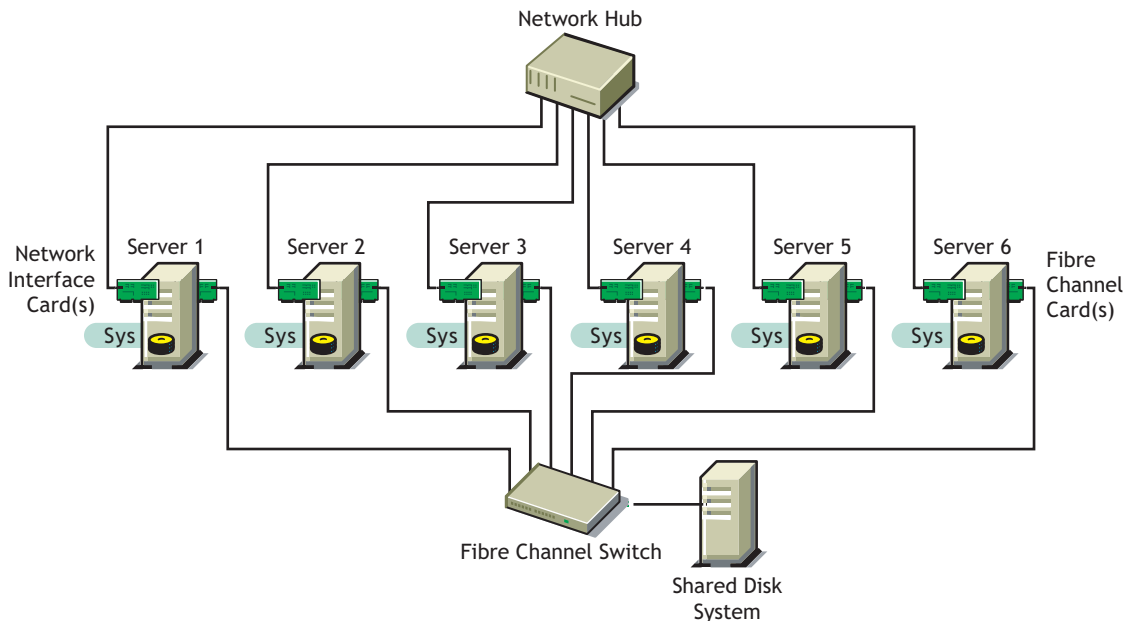
1

Overview

iSCSI is an emerging standard for SCSI block storage protocols networked over high-speed TCP/IP networks. iSCSI lets you create a low-cost Storage Area Network (SAN) using commodity high-speed Ethernet hardware. iSCSI provides significant cost savings when compared to the costs required to create a fibre channel SAN.

Currently, Novell® SANs consist of storage devices purchased from third-party storage vendors. Most SANs are constructed using fibre channel devices and storage arrays. A fibre channel host bus adapter is installed into each NetWare® server and connects each server to a fibre channel switch and external shared storage arrays. The SAN consolidates storage resources for servers running NetWare. RAID sets or individual disk drives located inside centralized storage arrays are exclusively assigned to individual servers in order to emulate direct-attached disks dedicated for each server, or they are assigned to and shared by multiple servers if running cluster software like Novell Cluster Services™. The following figure shows how a typical fibre channel SAN configuration might look.

Figure 1 Typical Fibre Channel SAN Configuration



The configuration illustrated above creates two separate networks and corresponding management domains. One is the fibre channel SAN dedicated to storage. The other is the traditional local area network that carries file, messaging, Web, LDAP, and other standard client/server protocol packets that clients of NetWare servers use to interact with Novell services.

NetWare iSCSI allows a SAN to be built using the same hardware and management domain that is used in a traditional LAN. An iSCSI SAN can use the same infrastructure as the LAN or it can have its own dedicated infrastructure.

NetWare iSCSI consists of software that you add to your existing NetWare servers. It lets you use existing hardware on your NetWare network to create a SAN and a NetWare cluster.

NetWare iSCSI software is divided into two parts, Initiator software and Target software. Only initiator software is included in this release. iSCSI target software is included with NetWare 6.5.

NetWare iSCSI initiator software is installed and configured on servers in the SAN that will be used to access shared storage. Initiators can be cluster servers. Initiators use the iSCSI protocol to communicate with an iSCSI storage server or target over a TCP/IP network.

Product Features

NetWare iSCSI includes several important features to help you create and manage a low-cost NetWare SAN:

- ◆ Support for standard TCP/IP networks using commodity Ethernet hardware.
- ◆ Single point of administration through the browser-based NetWare Remote Manager. This lets you remotely manage your iSCSI SAN.
- ◆ Support for the iSCSI draft specification (Ratified Standard Draft 20).
- ◆ Support for Challenge Handshake Authentication Protocol (CHAP) authentication for initiator identity verification.
- ◆ Interoperability with industry standard iSCSI storage servers or targets, including Cisco*, Network Appliance, Adaptec* and others.
- ◆ Easy installation and configuration, especially compared to the complexity involved in installing and configuring a fibre channel SAN.

Product Benefits

Fibre channel hardware is expensive and complex to manage. NetWare iSCSI lets you consolidate storage and improve the management of your storage infrastructure on the well known TCP/IP infrastructure. It is a lower cost, more flexible alternative to fibre channel. With NetWare iSCSI, you can easily add storage and repartition existing storage between systems and logical groupings. If one user volume is growing too rapidly, storage from another area can be allocated to it.

Some of the benefits of implementing iSCSI include

- ◆ Low-cost hardware requirements
- ◆ Longer distance storage connectivity
- ◆ Easy-to-manage SAN solution
- ◆ Scalability and flexibility
- ◆ Reduced SAN management training requirements
- ◆ Increased flexibility in storage management and growth
- ◆ Ability to create a SAN from existing direct-attached storage servers

The benefits NetWare iSCSI provides can be better understood through the following scenario:

John is responsible for the network at the marketing ad agency he works at. For five years, a 70 GB hard disk in a server with an attached tape backup unit has met the needs of the small firm of 10 account reps and support staff. Then one of the account reps decided to create a proposal using digital video for a client, and the rest of the staff decided to do the same. One month later, all of the 70 GB was used up. John purchased 136 GB of additional disk space and directly attached it to his server. He had to bring the server down to plug in the new adapter card, hook up the storage, and configure the additional adapter and storage. Two months later, he noticed that he again needed additional storage. He purchased another 364 GB, and had to configure it and get it added into the system. System backups had started taking longer than a weekend, so he added another tape drive for backup. A few months later, he determined that another 1.3 TB was needed, and this would need to be on a SAN with LAN Free backup in order to manage the large amount of data. John started looking for an easy solution with lower costs, because the firm did not have the financial resources to purchase a 1.3 TB SAN. He is now stuck between a rock and a hard place.

John needs a cost-effective mass storage solution that can be easily managed. This includes data protection (backup or archival) that doesn't require John to learn a lot of new skills.

John expects to be able to add storage to his network without going through complex tasks to configure and install the storage, and he cannot succumb to down time. Adding storage should also automatically deal with his data protection problems.

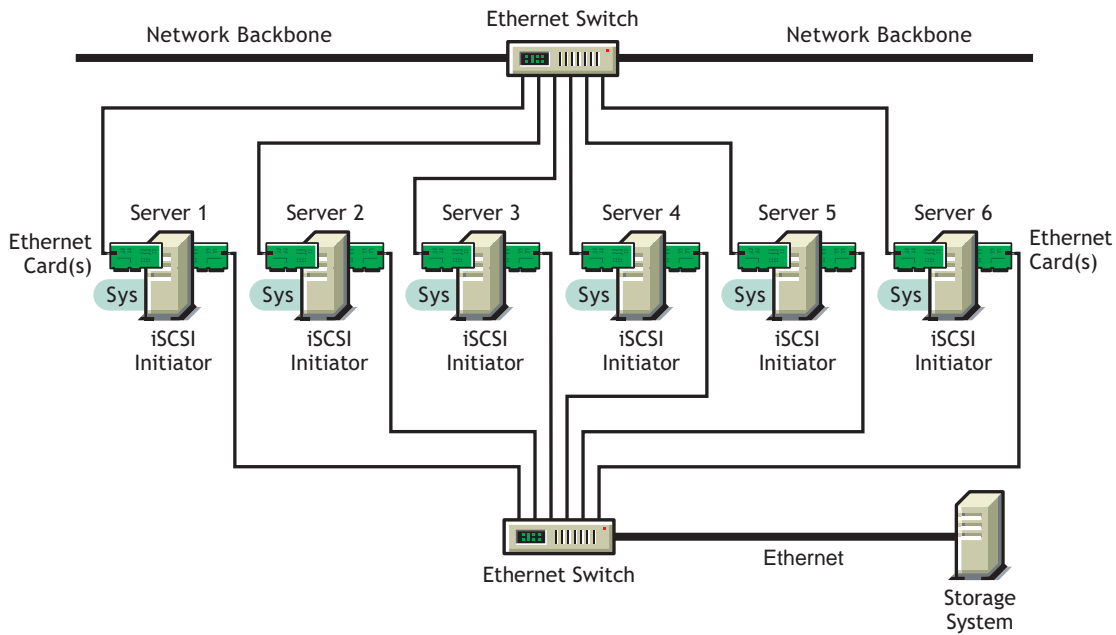
With NetWare iSCSI, John's problem is solved. His SAN infrastructure investment is no more than Gigabit Ethernet. He is already trained on 100 MB Ethernet for his LAN topology, so the required training for the hardware infrastructure is not needed. For iSCSI, the training is minimal. With Novell's LDAP-enabled iSCSI solution, management is simplified. The greatest cost is for the 1.3 TB disk array, which is much less expensive than a fibre channel SAN solution. Coupled with Novell's snapshot technology included in NetWare 6.5, he has an inexpensive solution for managing his rapidly growing data needs.

iSCSI SAN Configurations

A storage server or target is required for this iSCSI Initiator release. A storage router connected to a fibre channel SAN can also be used.

A SAN configuration that incorporates an iSCSI storage router is illustrated below. The iSCSI storage router configuration utilizes standard Ethernet hardware. Servers are connected via Ethernet connections to the iSCSI storage router, which is part of the shared storage system.

Figure 2 iSCSI Router Configuration



What's Next

To install and configure NetWare iSCSI, continue with [Chapter 2, "Installation, Configuration, and Management,"](#) on page 13.

2

Installation, Configuration, and Management

This section contains information that will help you install, configure, and manage iSCSI.

iSCSI Initiator Server Requirements

NetWare® 5.1 SP5 or NetWare 6 SP3 installed on all servers that will run iSCSI initiator software.

iSCSI Target Requirements

- ◆ iSCSI target device that supports the iSCSI Internet Draft Specification 20 (the ratified standard)
- ◆ Shared disk system connected to the iSCSI target device and configured according to the device manufacturer's instructions

Installing iSCSI Initiator Software

Download the iSCSI initiator package (self extracting .exe) to a client workstation, extract the .zip and .nfs files, and copy them to the root of the sys: volume on each server that will be used to access shared storage. Extract the files from the .zip file by entering ISCSINST at the server console. When you extract the files from the iSCSI Initiator download, they are automatically copied to the appropriate directories on your NetWare server.

IMPORTANT: If you intend to install Novell® Cluster Services™ software, you must do so *after* installing and configuring iSCSI initiator software and *before* partitioning the disks on the shared disk system.

Configuring iSCSI Initiators

NetWare iSCSI initiator software can be configured either at the server console using server console commands or remotely using NetWare Remote Manager. In order to configure an iSCSI initiator using NetWare Remote Manager, NetWare Remote Manager must be configured and working properly on a secure port. See “[Accessing NetWare Remote Manager](#)” in the [NetWare 6.5 NetWare Remote Manager Administration Guide](#) for more information.

Loading iSCSI Initiator Software and Connecting to an iSCSI Target

Using Server Console Commands

For each server that you want to function as an iSCSI initiator, do the following:

- 1 Enter **ion** at the server console to load iSCSI initiator software.

You can also enter **ioff** at the server console to unload iSCSI initiator software.

- 2 Enter **iscsinit connect a.b.c.d target_name** at the server console.

Replace *a.b.c.d* with the IP address of the iSCSI storage router that is connected to the shared storage system.

Replace *target_name* with the iSCSI target name that is displayed after running the **iscsinit discover a.b.c.d** command. The iSCSI target name is case sensitive. You can leave the target name out to cause the initiator to connect to all available targets.

- 3 (Optional) To use CHAP authentication when connecting to an iSCSI target, use the /CHAP command line option with the **iscsinit connect** command.

For example, if you have configured a locally stored CHAP secret and you want CHAP to use it, you would enter **iscsinit/chap connect a.b.c.d** at the command line.

If you want to use a user-supplied CHAP secret, you would enter **iscsinit/chap="sys:\system\chap.txt connect a.b.c.d** at the command line.

The *chap.txt* file must be created prior to running the command and must contain the following lines:

Outgoing Username=initiator name or agreed upon name

Outgoing Password=shared secret text

You can configure and enable CHAP using NetWare Remote Manager. For more information on configuring and enabling CHAP, see [“Enabling and Configuring iSCSI Initiator Security” on page 14](#).

If you want iSCSI initiator software to load automatically when servers start, you can add the commands in the above steps to the *autoexec.ncf* file of each initiator server.

Using NetWare Remote Manager

For each server that you want to function as an iSCSI initiator:

- 1 Enter **ion** at the server to load iSCSI initiator software.

You can do this either at the server console or remotely by using NetWare Remote Manager to access the server console.

- 2 On the NetWare Remote Manager main page, click the iSCSI Services link at the bottom of the left column.

- 3 Click Add Target and type the IP address of the iSCSI target device (storage router) that is connected to the shared storage system.

Each target device can have multiple targets.

If you want a list of possible target names for a given IP address, click Browse and type the IP address of the target device.

- 4 Click Next, select the target name you want to establish a session with, then click Next.

Enabling and Configuring iSCSI Initiator Security

Configuring iSCSI initiator security consists of configuring the initiator-to-target authentication method. Challenge Handshake Authentication Protocol (CHAP) authentication is the method currently supported for initiator identity verification. CHAP protects against attacks and provides secure access between the iSCSI initiator and the target. If CHAP is not enabled, someone could potentially use the identity of a valid initiator to gain unauthorized access to iSCSI target devices. CHAP authentication is not enabled by default.

If your iSCSI target has CHAP enabled, you must enable CHAP on the initiators that will access that target, or target access will be denied. CHAP authentication is not currently supported on NetWare servers configured as iSCSI targets.

To enable and configure CHAP authentication using NetWare Remote Manager:

- 1** On the NetWare Remote Manager main screen, click the iSCSI Services link at the bottom of the left column.

- 2** Click the Security link.

This brings up a page that lets you choose the initiator-to-target authentication method.

- 3** Choose CHAP as the authentication method, then click Apply.

If you choose CHAP, you must create a CHAP secret that will be used to ensure secure authentication between this initiator and the target.

- 4** Click Create to bring up a page that lets you configure the CHAP secret.

If you have already configured a locally stored CHAP secret, the Update, Delete, and Change To buttons appear to let you modify or delete your existing secret, or change it to a user supplied secret. If you have already chosen the user supplied secret option, a Change To button appears to let you change to a locally stored secret.

- 5** Choose whether you want the CHAP secret to be locally stored or user supplied.

A locally stored secret is encrypted and stored on the initiator server. The same locally stored secret is used each time a session is started between this initiator and the target. Selecting the Locally Stored Secret option brings up a page that lets you specify the CHAP username and secret.

If you choose a user supplied CHAP secret, you will be prompted to create the CHAP secret each time you start a session between this initiator and the target. With this option, the CHAP secret is not stored on the initiator server, and it is not encrypted.

- 6** (Conditional) If you chose to create a locally stored CHAP secret, view and if necessary edit the CHAP username and create a CHAP secret.

The Initiator CHAP Username field is automatically filled in. It is the Internet Qualified Name (IQN) of this initiator. This field should not be changed unless you change the IQN of this initiator or you want to create or modify a CHAP locally stored secret for another initiator.

The Initiator CHAP Secret can include any ASCII characters and should be at least 16 characters long. The secret is encrypted and stored locally on the initiator.

- 7** Repeat the above steps to enable and configure CHAP authentication for each initiator server.

Shared Disk Configuration

Initialize and partition the disks on the shared storage system and create pools and volumes.

It is only necessary to perform this step from one server running iSCSI initiator software.

Managing iSCSI

NetWare iSCSI software includes management features that let you create or end iSCSI initiator/target sessions, view or edit initiator properties, and monitor iSCSI status and connection information.

Creating an iSCSI Session

To create an iSCSI initiator/target session, follow the instructions in “[Configuring iSCSI Initiators](#)” on page 13.

Ending an iSCSI Session

You can end an iSCSI target session at the initiator server console or by using NetWare Remote Manager.

To end an iSCSI target session at the initiator server console, enter **iscsinit disconnect a.b.c.d**

Replace *a.b.c.d* with the IP address of the iSCSI target device (storage router).

Using the `iscsinit disconnect` command will disconnect or end all iSCSI target sessions for the specified IP address. If you want to end an iSCSI target session for a specific target, use NetWare Remote Manager.

To end an iSCSI target session using NetWare Remote Manager:

- 1 On the NetWare Remote Manager main page, click the iSCSI Services link at the bottom of the left column.
- 2 Click End Session.
- 3 Check the check box next to each target you want to disconnect from this initiator, then click Next to disconnect them.

Viewing and Editing Initiator Properties

You can view iSCSI initiator properties at the initiator server console or by using NetWare Remote Manager. To change iSCSI initiator and driver properties, you must use NetWare Remote Manager.

To view iSCSI initiator properties at the initiator server console, enter **iscsinit info**.

To view or change iSCSI initiator properties using NetWare Remote Manager:

- 1 On the NetWare Remote Manager main page, click the iSCSI Services link at the bottom of the left column.
- 2 Click the Properties link to bring up a page that lets you view or change initiator and driver properties.
- 3 View or change the desired properties, then click Finish to save changes.

Current initiator and driver properties include the following:

- ◆ Authentication Method
- ◆ Frontpage Display Controls
- ◆ Connection Path Recovery Controls
- ◆ Number of LUN Probes per Target
- ◆ Display Driver Statistics
- ◆ Performance and Trend Graphs
- ◆ Reports

Authentication Method

The default authentication method is None. This property cannot be changed or deselected for this release.

Frontpage Display Controls

The Frontpage Display Controls check boxes determine what information is displayed on the iSCSI initiator main page. Checking a check box causes that information to be displayed. For example, if you check the Network Address check box, the IP address of the target device will be displayed in the Storage Sessions section of the iSCSI initiator main page.

Connection Path Recovery Controls

The Connection path recovery controls are tolerance and timeout configuration settings for communication between initiators and targets. You can enable or disable Connection path recovery controls. These controls are configured to default settings, and should not be changed except under the direction of Novell Technical Support.

Number of LUN Probes per Target

The number of LUN probes per target is the number of targets you want the initiator to communicate with on the target device.

Display Driver Statistics

Checking the Display Driver (HAM) Statistics check box causes operational statistics to be displayed on the iSCSI initiator main page. There will also be link on the main page to an iSCSI Device Driver Requests graph.

Performance and Trend Graphs

If you check the Performance and Trend Graphs check box, there will be links to informative graphs for Data Transfer Rate and Trend Distribution on the iSCSI initiator main page.

Reports

If you check the Reports check box, there will be buttons to view or e-mail the iSCSI report on the iSCSI initiator main page. The iSCSI report contains statistics for iSCSI files and functions.

Restoring NSS Volume Access

If you are accessing an iSCSI target on a NetWare 6.5 server from a NetWare 5.1 initiator and you unload iSCSI initiator software, you might not be able to access NSS volumes on the iSCSI target server after reloading the iSCSI initiator software. If this happens, complete the following steps on the initiator after reloading iSCSI initiator software and connecting to the iSCSI target.

- 1** Start NWConfig by entering **nwconfig** at the initiator server console.
- 2** Select NSS Disk Options.
- 3** Select Storage (Configure NSS Storage)
- 4** Select Update Provider Information.
- 5** Select NSS Media Manager Provider and then press Enter.

Depending on the number and size of NSS volumes, it could take up to 30 seconds for this to complete.

- 6 Activate and mount the desired NSS volumes.