

Novell MySQL for NetWare Administration Guide

Novell® Open Enterprise Server

July, 2009

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About This Guide

This guide provides an overview of MySQL and describes how to install and configure it on NetWare® 6.5 SPx. To effectively use MySQL, a basic knowledge of the structured query language (SQL) is required.

This guide is divided into the following sections:

- ♦ Chapter 1, “Overview: MySQL,” on page 9
- ♦ Chapter 2, “Installing and Configuring MySQL,” on page 15
- ♦ Chapter 3, “Configuring MySQL on Novell Clustering Services,” on page 25
- ♦ Appendix A, “Documentation Updates,” on page 31

Audience

This guide is intended for network administrators and developers who need to understand the benefits of MySQL and how to install it in the NetWare environment.

Feedback

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 and enter your comments there.

Additional Documentation

Once MySQL is installed, visit the [MySQL Web site \(http://dev.mysql.com/doc/\)](http://dev.mysql.com/doc/) for official MySQL documentation.

For MySQL training documentation, visit [MySQL Training Web Site \(http://www.mysql.com/training\)](http://www.mysql.com/training).

Documentation Conventions

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

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Overview: MySQL

1

MySQL is an open source, structured query language (SQL) database. When combined with a Web application, MySQL serves as a very reliable and scalable database for use with business solutions such as eCommerce and business-to-business.

This chapter includes the following sections:

- ♦ [Section 1.1, “About MySQL,” on page 9](#)
- ♦ [Section 1.3, “What's New,” on page 10](#)
- ♦ [Section 1.4, “MySQL Architecture,” on page 10](#)
- ♦ [Section 1.2, “Benefits of MySQL,” on page 9](#)
- ♦ [Section 1.5, “Putting MySQL to Work: Web Database Applications,” on page 11](#)
- ♦ [Section 1.6, “What's Not Supported,” on page 12](#)
- ♦ [Section 1.7, “Additional MySQL Resources,” on page 12](#)
- ♦ [Section 1.8, “What's Next,” on page 13](#)

1.1 About MySQL

MySQL is a database management system (DBMS). A database is a structured collection of data. It might be anything from a simple shopping list to a picture gallery, to the vast amounts of information in a corporate network.

To access, manipulate, and process data stored in a database, you need a DBMS. Because computers are very effective at handling large amounts of data, database management plays a central role in computing.

But more than being a DBMS, MySQL is a relational database management system (RDBMS). A relational database stores data in separate tables rather than putting all the data into one large repository. Doing so adds tremendous speed and flexibility. The tables are linked by defined relations making it possible to combine data from several tables upon request.

RDBMS's play a central role in many types of eCommerce and eBusiness solutions. Amazon.com and eBay.com are examples of complex eCommerce solutions that depend on database applications to transact business with their customers and partners.

1.2 Benefits of MySQL

Whether you are a Web developer, CNESM, or a dedicated network administrator with an interest in building database applications, MySQL is easy to use, yet extremely powerful, secure, and scalable. And because of its small size and speed, it is the ideal database solution for Web sites.

Some of its advantages include the following:

- ♦ *It's easy to use:* While a basic knowledge of SQL is required—and most relational databases require the same knowledge—MySQL is very easy to use. With only a few simple SQL statements, you can build and interact with MySQL.

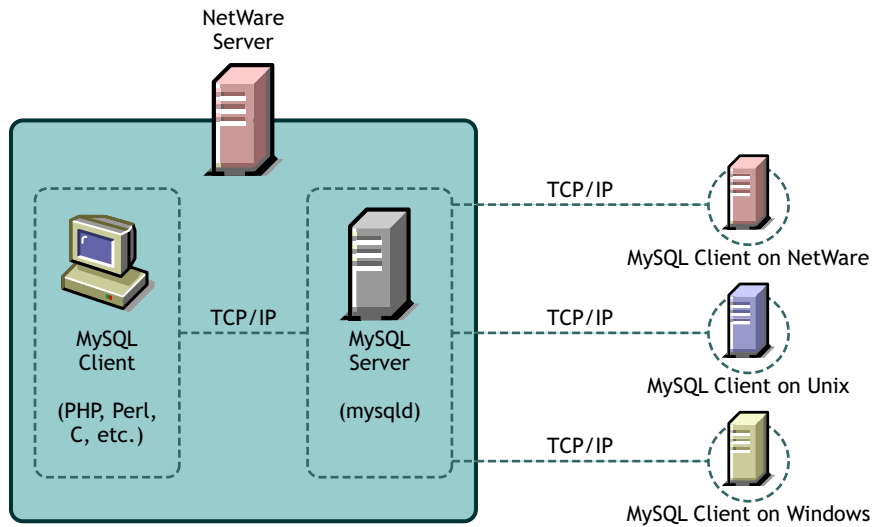
- ♦ *It's secure:* MySQL includes solid data security layers that protect sensitive data from intruders. Rights can be set to allow some or all privileges to individuals. Passwords are encrypted.
- ♦ *It's inexpensive:* MySQL is included for free with NetWare® 6.5 and available by free download from [MySQL Web site \(http://www.mysql.com\)](http://www.mysql.com).
- ♦ *It's fast:* In the interest of speed, MySQL designers made the decision to offer fewer features than other major database competitors, such as Sybase* and Oracle*. However, despite having fewer features than the other commercial database products, MySQL still offers all of the features required by most database developers.
- ♦ *It's scalable:* MySQL can handle almost any amount of data, up to as much as 50 million rows or more. The default file size limit is about 4 GB. However, you can increase this number to a theoretical limit of 8 TB of data.
- ♦ *It manages memory very well:* MySQL server has been thoroughly tested to prevent memory leaks.
- ♦ *It supports Novell Cluster Services:* MySQL on NetWare runs effectively with Novell® Cluster Services™, letting you add your database solution to a Novell cluster. If one server goes down, MySQL on an alternate server takes over and your customers won't know that anything happened.
- ♦ *It runs on many operating systems:* MySQL runs on many operating systems, including Novell NetWare, Windows* Linux*, many varieties of UNIX* (such as Sun* Solaris*, AIX, and DEC* UNIX), OS/2, FreeBSD*, and others.
- ♦ *It supports several development interfaces:* Development interfaces include JDBC, ODBC, and scripting (PHP and Perl), letting you create database solutions that run not only in your NetWare 6.5 environment, but across all major platforms, including Linux, UNIX, and Windows.

1.3 What's New

- ♦ MySQL version is upgraded to MySQL-4.0.26a
- ♦ phpMyAdmin is upgraded to 2.6.4-pl3
- ♦ JDBC driver is upgraded to 3.1.11
- ♦ MySQL IP Address management framework can now handle multiple instances of MySQL servers configured on a NetWare Server.

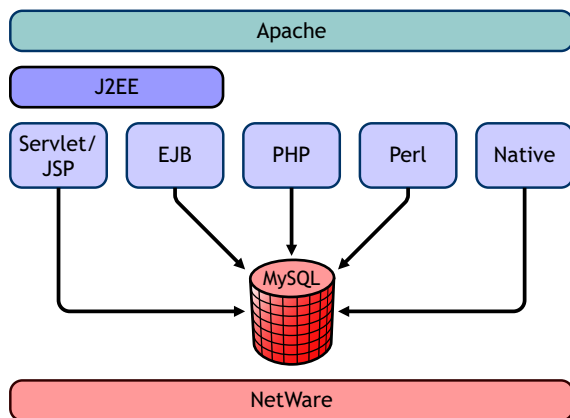
1.4 MySQL Architecture

MySQL runs over TCP/IP, making it highly accessible and capable of integrating into a Web environment. Clients across multiple platforms can access MySQL databases through the use of scripting languages such as PHP or Perl and C.



On a NetWare 6.5 server, MySQL can be installed with other Web components to provide an optimal Web architecture where you can build, deploy, and host Web database applications using PHP, Perl, EJBs, servlets, and JSPs.

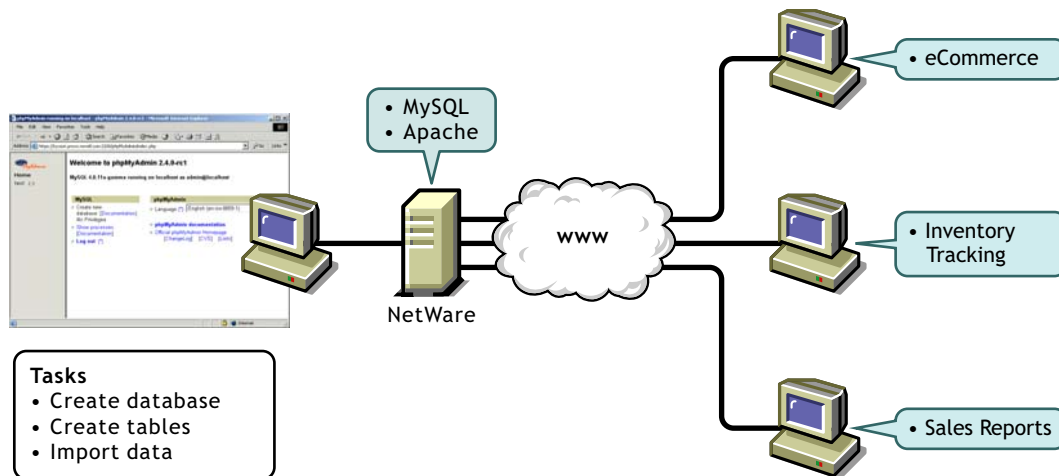
When you install the Web components included with NetWare, NetWare 6.5 is J2EE* compliant.



1.5 Putting MySQL to Work: Web Database Applications

By itself, a database offers little value. Even a database such as MySQL, capable of storing several terabytes of data, does little good if the data cannot be quickly searched, retrieved, and manipulated. For the database to be of any value, you must create a database application that is capable of communicating with the database.

Using a scripting language, such as PHP or Perl—both included with NetWare 6.5—you can create a Web database application, or front end, for use with your MySQL database. The scripting language issues commands to the MySQL server, which runs constantly, listening for commands and then manipulating the database accordingly, much like a Web server.



Therefore, scripting languages such as PHP or Perl provides the application component, and MySQL provides the database component, giving you a solid Web database application. Your customers can then access the database through a Web browser.

TIP: If you want to download and host ready-to-run applications using MySQL, Apache, and PHP or Perl, consider selecting the AMP (Apache, MySQL, PHP, Perl) Pre-Configured installation option when you install NetWare 6.5. For more information, see *NetWare AMP (Apache, MySQL, PHP, Perl) Server* in [NetWare 6.5 Web and Application Services Overview](#).

1.6 What's Not Supported

The following features are not supported in this release of MySQL on NetWare:

- ◆ Embedded server is not supported on NetWare.
- ◆ BDB is not supported on NetWare.
- ◆ The `-s --socket` option does not work. This option is UNIX-specific.
- ◆ Locking tables using the SQL function `get_lock` is not supported.
- ◆ The `-a` option is not supported, instead use `--autoclose` to automatically close the MySQL screen.

For example, instead of:

```
mysqladmin -u root -p shutdown -a
```

use the following command:

```
mysqladmin -u root -p shutdown --autoclose
```

1.7 Additional MySQL Resources

The MySQL Web site offers a great deal of documentation and training material to help you get started. If you're an expert already, the MySQL Web site can show you how to take advantage of the power of MySQL. There are also several well-written books available today from most retail book stores.

MySQL Documentation

To access the official MySQL documentation, visit [MySQL documentation Web site \(http://dev.mysql.com/doc/mysql/en/index.html\)](http://dev.mysql.com/doc/mysql/en/index.html).

MySQL Training

The MySQL training Web site offers a great deal of training material. Some of the topics include:

- ♦ Introduction to Databases with MySQL
- ♦ Developing Dynamic Web Applications with MySQL and PHP
- ♦ Using and Managing MySQL
- ♦ Managing MySQL
- ♦ MySQL Cluster for High Availability
- ♦ Using and Developing with MaxDB
- ♦ MaxDB Administration
- ♦ Storing Sensitive Information with MySQL

To access MySQL training, visit [MySQL Training Courses \(http://www.mysql.com/training\)](http://www.mysql.com/training).

MySQL Support

Novell offers entry level support for MySQL users. To access Novell support, visit [http://support.novell.com \(http://support.novell.com\)](http://support.novell.com).

MySQL offers four levels of support: Entry, Primary, Enhanced, and Premium. To access MySQL support, visit [http://www.mysql.com/support \(http://www.mysql.com/support\)](http://www.mysql.com/support).

1.8 What's Next

For information about installing MySQL and using it on the NetWare platform, see [Chapter 2, “Installing and Configuring MySQL,” on page 15](#).

For information about using MySQL, see the [MySQL Documentation \(http://dev.mysql.com/doc/mysql/en/index.html\)](http://dev.mysql.com/doc/mysql/en/index.html) Web site.

Installing and Configuring MySQL

2

MySQL on NetWare® is installed from the *NetWare 6.5 Products CD*. You can install it during the NetWare 6.5 install process as a stand-alone product, or you can dedicate a server to MySQL by selecting the NetWare AMP (Apache, MySQL, PHP, Perl) pattern. If you didn't install MySQL during the NetWare 6.5 installation process, you can install it using the NetWare 6.5 post-installation application.

This chapter contains the following topics:

- [Section 2.1, “Before Installing MySQL,” on page 15](#)
- [Section 2.2, “Installing MySQL,” on page 17](#)
- [Section 2.3, “Manually Starting MySQL and Setting the Root Password,” on page 20](#)
- [Section 2.4, “Administering MySQL Using phpMyAdmin,” on page 20](#)
- [Section 2.6, “Configuring Multiple Instances of MySQL Server on NetWare,” on page 21](#)
- [Section 2.7, “Using the JDBC Driver with MySQL,” on page 21](#)
- [Section 2.8, “Uninstalling MySQL,” on page 22](#)
- [Section 2.9, “Maintaining NSS Pools or Volumes with MySQL Data folder,” on page 22](#)
- [Section 2.10, “Upgrading to Latest MySQL Releases,” on page 23](#)
- [Section 2.11, “What's Next,” on page 23](#)

2.1 Before Installing MySQL

Before installing MySQL, review this section for information about prerequisites, upgrading, and information that is required during the installation process. If you are installing MySQL as part of the NetWare AMP preconfigured server option, review [“Installing As Part of NetWare AMP” on page 19](#) for specific information about changes made to your server during installation.

2.1.1 Upgrading a NetWare Server

If you want to install MySQL when upgrading a NetWare 5.1 or 6.0 server to NetWare 6.5, you must do so after the server is already installed. This is because MySQL requires that its databases be stored on a NetWare 6.5 NSS volume. Even if you have an NSS volume on NetWare 5, the server upgrade requires that you to run an NSS upgrade utility before the NSS volume can be mounted. You cannot install MySQL until the NSS volume is mounted.

During an upgrade, the MySQL installation process performs the following actions:

1. If the MySQL server is running, it is shut down.
2. If `sys:\etc\my.cnf` exists, it is saved as `sys:\etc\my.cnf.upg`.
3. MySQL is uninstalled. This does not remove any files that have been modified after they were installed.
4. MySQL is reinstalled. If `sys:\etc\my.cnf.upg` exists, MySQL copies it back to `sys:\etc\my.cnf` and uses it for configuring MySQL. The MySQL Options install screen is not displayed.

5. If the data directory already contains MySQL grant tables (the install checks for `mysql\host.frm`), then the MySQL install uses the existing database and does not create a new initial MySQL database.
6. During upgrade all the existing configuration files remain intact. However, for phpMyAdmin, the latest version of sample configuration file is copied to `sys:\adminsrv\phpapps\phpmyadmin as config.inc.php-new`.

TIP: If you are installing the Novell® exteNd™ Application Server, MySQL is also installed. This is because MySQL is required by the exteNd Application Server. Therefore, these same issues apply.

Upgrading a NetWare 5.1 or 6 Server

When upgrading a NetWare 5.1 or 6 server and installing MySQL, a message appears indicating that MySQL cannot run on a traditional volume. Because NSS volumes are not mounted or created during an upgrade, perform the following steps to configure MySQL:

- 1 After first upgrading your NetWare 5.1 server to a NetWare 6.5 server, create an NSS volume or upgrade existing NSS volumes.
 - ♦ To create a new NSS volume, use the NSS Management Utility, and enter `nssmu` at the system console.
 - ♦ To upgrade an existing NSS volume, enter `nss \z1ssvolumeupgrade=all` at the system console.
- 2 Edit `sys:\etc\my.cnf` by entering the correct volume and path to the MySQL data directory.
For example:

```
datadir=nssvol:\mysql\data
```

- 3 At the NetWare console, enter

```
mysql_install_db
mysqld_safe
perl sys:\mysql\scripts\mysql_secure_installation.pl
```

The last command runs the `mysql_secure_installation.pl` Perl script, which lets you configure security for MySQL.

- 4 **If Novell exteNd Application Server was installed:** Configure the Novell exteNd Application Server by entering the following at the system console:

```
load silverinit appserverpassword adminpassword mysqlrootpassword
```

Each of these passwords is explained in the `sys:\extend\appserver\bin\silverinit.ncf` file.

2.1.2 Upgrading a NetWare Server having MySQL 4.1 or later

The install for MySQL on NetWare does not detect if a MySQL version is already installed outside the NetWare release.

Therefore, if you have installed the latest MySQL version from the Web (for example, MySQL 4.1) to `sys:\mysql`, then you need to rename the folder before upgrading the NetWare server.

2.2 Installing MySQL

During the NetWare 6.5 installation process, you can customize your server by selecting individual components to be installed, or you can select a specific server type from a list of fifteen pre-configured servers, which installs the necessary software needed to support a specific server solution.

For example, if you wanted to dedicate a NetWare server to hosting database-driven Web applications, you could select the NetWare AMP (Apache, MySQL, PHP, Perl) Server from the Pre-Configured Servers list. Or, if you simply needed to build and host a database, you could select MySQL from the Components dialog box when you choose the Custom NetWare Server option.

The following table can help you decide which installation option you should choose based on how you want to use MySQL on NetWare 6.5.

If You Want To	Do This
Dedicate a NetWare 6.5 server to hosting Web database applications that you download from the World Wide Web, or that you create yourself	Select NetWare AMP (Apache, MySQL, PHP, Perl) Server from the Pre-configured Servers list during the NetWare 6.5 installation. This option installs Apache Web Server 2.0, MySQL 4.0, and the PHP and Perl scripting engines.
Add MySQL as a component to your customized NetWare 6.5 installation, which you can use to create, manage, and host databases	Select MySQL from the Components list when selecting the Customized NetWare Server option. This option installs MySQL 4.0.
Install MySQL after installing NetWare 6.5	Run the NetWare post-install program from the NetWare GUI and select MySQL. TIP: You can also install MySQL remotely using the NetWare Deployment Manager. This option installs MySQL 4.0.

After you have decided which installation option to use, see the *NetWare 6.5 Overview and Installation Guide* for detailed installation instructions.

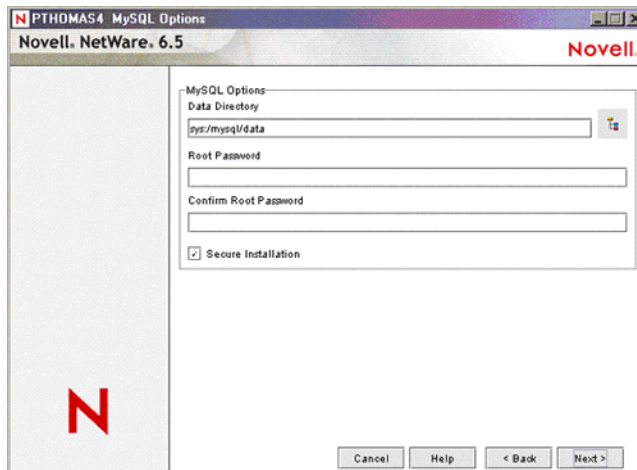
For important legal issues related to your use of MySQL 4.0, refer to the `sys:\mysql\license.doc` file after installation.

For information about removing MySQL from your server, see [Section 2.8, “Uninstalling MySQL,” on page 22](#).

2.2.1 Information Required During Installation

Regardless of the method you choose, you are asked to specify the following information:

- ♦ *Data Directory*: The MySQL data directory is where MySQL databases are stored. The directory must reside on an NSS volume. The default location is `sys:\mysql\data`. The MySQL install sets this path as the value of the `datadir` property in the `[mysqld]` section of `sys:\etc\my.cnf`.
- ♦ *Root Password*: The MySQL root user is created as a superuser who has access rights to perform any function.



Secure Installation

By default, the Secure Installation check box is checked. Therefore, the MySQL install requires a root password before proceeding. This creates and configures the initial MySQL database and ensures the following:

- ♦ The initial MySQL database is created and configured so that only the root user is allowed to connect to it, and only from the local host.
- ♦ The anonymous user and the test database are not created.

IMPORTANT: For production servers, we recommend that you leave Secure Installation checked so that the remote and anonymous users and test databases are not created.

Security Problems that Occur When Secure Installation is not enabled:

- ♦ The root user can connect from the local host or remotely.
- ♦ An anonymous user is also created and can connect from the local host or remotely.
- ♦ By default, an initial test database is created. This means that any local user can connect without a password and be treated as the anonymous user.
- ♦ The anonymous user can perform any function on any databases named "test" or whose name begins with "test_."

2.2.2 Installing As Part of NetWare AMP

When you select the NetWare AMP pre-configured server option, the following changes are made to the `sys:\etc\my.cnf` file to optimize the performance of MySQL on NetWare 6.5:

If server memory \geq 500 MB:

```
key_buffer_size = 128M
```

```
table_cache = 128
```

```
sort_buffer_size = 4M
```

```
myisam_sort_buffer_size = 32M
```

```
read_buffer_size = 1M
```

If server memory \geq 1 GB:

```
key_buffer_size = 256M
```

```
table_cache = 256
```

```
sort_buffer_size = 8M
```

```
myisam_sort_buffer_size = 64M
```

```
read_buffer_size = 2M
```

In addition, the `namp_config_on.ncf` file is run which makes the following server setting changes:

```
SET TCP Minshall Algorithm = ON
```

```
SET Maximum Pending TCP Connection Requests = 4096
```

You can run `namp_config_off.ncf` to manually reset these settings:

```
SET TCP Minshall Algorithm = OFF
```

```
SET Maximum Pending TCP Connection Requests = 128
```

`Startx`, the command that starts the NetWare GUI, is not included in the `autoexec.ncf`. Leaving it out of the `autoexec.ncf` prevents the NetWare GUI from starting up automatically whenever the server is restarted, which makes additional system resources available for use by MySQL.

2.3 Manually Starting MySQL and Setting the Root Password

When installation of MySQL is complete, it should run automatically. However, you can manually start MySQL from the NetWare system console and at the same time set your root password.

To start MySQL and set your administrator password:

- 1 At the NetWare console, type `mysqld_safe` and press Enter to start the MySQL server.
- 2 Type `mysqladmin -u root password password` and press Enter to set the root password.
Replace *password* with your own password.

2.4 Administering MySQL Using phpMyAdmin

You can use phpMyAdmin, a popular web based tool for MySQL database administration.

To access phpMyAdmin:

- 1 Go to the NetWare server administration page.
For example, <https://servername:2200/welcome/index.html>.
- 2 In the left panel, from Open Source, select MySQL 4.0.
- 3 In the MySQL 4.0 page, click *phpMyAdmin* link from the MySQL links to launch the phpMyAdmin authentication dialog box.
- 4 In the phpMyAdmin authentication dialog box, enter the MySQL username and password to access the phpMyAdmin administration page.

With phpMyAdmin you can administer the following MySQL tasks:

- ♦ Create and drop databases
- ♦ Create, copy, drop, rename and alter tables
- ♦ Table maintenance
- ♦ Execute any SQL-statement, even batch-queries
- ♦ Delete, edit and add fields

NOTE: When using the phpMyAdmin on Internet Explorer, saving the files using export might fail.

2.5 MySQLHotCopy

Make sure to use only the forward slash (/) when specifying pathnames using mysqlhotcopy.

2.6 Configuring Multiple Instances of MYSQL Server on NetWare

MySQL IP Address management framework can now handle multiple instances of MySQL servers configured on a NetWare Server. If you have more than one instance of MySQL server running on your NetWare server, you can configure each one of them by doing the following steps.

- 1 Include the following lines in the `sys:\system\ipconf\mysql\pullcfg.ncf` file

```
delay 2

perl --noscreen sys:\system\ipconf\mysql\mysql_pull.pl Path_to_Cnf
sys:\system\ipconf\mysql\appconf.xml
```

- 2 Include the following lines in the `sys:\system\ipconf\mysql\pushcfg.ncf` file

```
delay 2

perl --noscreen sys:\system\ipconf\mysql\mysql_push.pl Path_to_Cnf
sys:\system\ipconf\mysql\appconf.xml
```

where Path_to_Cnf is the absolute path to the `my.cnf` configuration file

2.7 Using the JDBC Driver with MySQL

With MySQL installation of this NetWare release, the latest JDBC driver is copied to `sys:\java\lib\ext` and `sys:\mysql\java` on the NetWare server.

After the upgrade, make sure that only one version of MySQL JDBC connector file is available in `sys:\java\lib\ext`. All the older versions of this file must be deleted.

To connect to MySQL using JDBC driver, you need to grant the appropriate rights to the user in order to communicate with your MySQL database. For more information, see [MySQL Java* Connectivity \(JDBC\)](http://www.mysql.com/doc/en/Java.html) (<http://www.mysql.com/doc/en/Java.html>).

The driver `com.mysql.jdbc` must be loaded using the `Class.forName()` method. The default port is 3306 and the default database name is the same as the username you use to connect to MySQL. Use the following syntax:

```
jdbc:mysql://hostname:port/dbname?param1=value1&param2=value2
```

An example connection would look like this:

```
Class.forName("com.mysql.jdbc");
java.sql.Connection conn;
conn = DriverManager.getConnection("jdbc:mysql://<hostname>:
<port>//<database>", "user", "password");
```

For JDBC tutorials, see the Sun [Java Learning Center \(http://java.sun.com/products/jdbc/learning.html\)](http://java.sun.com/products/jdbc/learning.html).

Also, refer to the JDBC driver readme in the driver's ZIP file located at `sys:\mysql\java`.

2.8 Uninstalling MySQL

- 1 If the MySQL server is running, run `mysqladmin shutdown -u root -ppassword` or run `unload mysql` at the server console to shut it down.
Make sure that the MySQL Database Server screen has closed. If `mysqld_safe` was not started with the `--autoclose` option, you will need to go to the MySQL Database Server screen and press any key to close the screen.
- 2 If the server GUI console is not running, enter `startx` at the system console.
- 3 Click *Install* on the Novell menu.
- 4 In the Installed Products dialog, select MySQL and click Remove.
- 5 In the Confirm Product Deletion dialog box, click OK.

When the Installed Products dialog box reappears, verify that MySQL is no longer there. If it is, make sure that the MySQL server is down and the MySQL Database Server screen has closed. Then repeat this procedure, beginning with **Step 4**.

- 6 After the uninstall process is complete, delete the following file and directories:
 - ♦ `sys:\etc\my.cnf`, which is the MySQL configuration file
 - ♦ `sys:\mysql`, which is the default MySQL directory

Also, delete the MySQL data directory if it was not under the `sys:\mysql` directory. Delete the `sys:\etc\my.cnf`. Also, delete the following files if they exist.

- ♦ `sys:\etc\my.cnf.org`
- ♦ `sys:\etc\my.cnf.upg`
- ♦ `sys:\etc\my.cnf.sav`

TIP: If you attempt to reinstall MySQL before deleting the MySQL configuration file and the MySQL directories, the MySQL install process reuses these folders and files. For more details, review **“Upgrading a NetWare Server” on page 15**.

2.9 Maintaining NSS Pools or Volumes with MySQL Data folder

MySQL automatically unloads when performing any of the following maintenance operations on NSS pools or volumes:

- ♦ Rebuilding, verifying or repairing NSS pools that have volumes with a MySQL data folder.

- ♦ Manually deactivating NSS pools or volumes that have a MySQL data folder.
- ♦ Performing any NSS operation that deactivates a pool or a volume that has a MySQL data folder.

For more information about NSS pools and volumes, see “**Managing NSS Pools and Volumes**” in the *Novell Storage Services File System Administration Guide for NetWare 6.5*.

2.10 Upgrading to Latest MySQL Releases

Latest versions of MySQL on NetWare are made available for download periodically. Upgrade to the latest versions of MySQL for NetWare from the [MySQL Downloads Web site \(http://dev.mysql.com/downloads/\)](http://dev.mysql.com/downloads/).

2.11 What's Next

After MySQL is installed and running, refer to the [MySQL Documentation \(http://www.mysql.com/doc/en/index.html\)](http://www.mysql.com/doc/en/index.html) on the MySQL Web site for complete instructions on using and managing MySQL.

Configuring MySQL on Novell Clustering Services

3

MySQL can be used with Novell® Cluster Services™ (NCS) to provide high availability support to the customers you service with MySQL. This means that if one server goes down, another server takes over and customers never experience an interruption to the services you provide.

You can configure MySQL* for NetWare® and Linux for the active/passive modes of Novell® Cluster Services™. In the active/passive cluster mode, MySQL services run on only one node in the cluster at a time. For example, if the node where MySQL is installed fails, then MySQL starts on other specified nodes in the cluster and the MySQL services on the failed server fail over to other nodes in the cluster.

This chapter discusses the following topics:

- ♦ [Section 3.1, “Prerequisites,” on page 25](#)
- ♦ [Section 3.2, “Configuring MySQL on a NetWare Cluster,” on page 25](#)
- ♦ [Section 3.3, “Configuring MySQL on a OES 2 SP1 Linux Cluster,” on page 26](#)

3.1 Prerequisites

- ❑ MySQL services are installed on every node in the cluster
- ❑ Novell Cluster Services is installed and set up

For step-by-step instructions on setting up Novell Cluster Services, refer to [Installation and Setup \(http://www.novell.com/documentation/oes/clus_admin_nw/data/hc8jxt45.html#hc8jxt45\)](http://www.novell.com/documentation/oes/clus_admin_nw/data/hc8jxt45.html#hc8jxt45) in the *OES Novell Cluster Services 1.8 Administration Guide for NetWare*.

3.2 Configuring MySQL on a NetWare Cluster

To configure MySQL on Novell Cluster Services:

- 1 Bring down the existing instances of MySQL services (mysqld) on each node in the cluster using the following command format:

```
mysqladmin -u root -ppassword --autoclose
```

- 2 In every node in the cluster, edit `autoexec.ncf` and comment out the following entry.

```
mysqld_safe --autoclose
```

This lets Novell Cluster Services start MySQL for NetWare.

- 3 On one of the nodes in the cluster, create a shared pool and volume. Enter the shared IP address where MySQL service will run.

For example, let the volume name be SHAREDVOL

- 4 Prepare MySQL service to use the shared volume:

4a Create a folder `sharedvol:\mysql`

- 4b** Copy the configuration file `my.cnf` from `sys:\etc` to `sharedvol:\mysql`
- 4c** Create a folder for data directory for MySQL, `sharedvol:\mysql\data`
- 4d** Edit the file `sharedvol:\mysql\my.cnf` and comment out the following entries:
 - ♦ `bind-address=0.0.0.0`
 - ♦ `datadir=sys:\mysql\data`
- 5** (Optional) If migrating `datadir`, skip this step and go to **Step 6**; otherwise, execute the following:


```
mysql_install_db --datadir=sharedvol:\mysql\data
```
- 6** Go to *Network Remote Manager (NRM) > Cluster Config*, then edit the load and unload script of the MySQL cluster volume resource.
 - 6a** The load script specifies the commands to start the resource or service on a server or to mount the volume on a server. Add the following at the end of the existing load script:


```
mysqld_safe --defaults-file=sharedvol:\mysql\my.cnf --bind-address=a.b.c.d --datadir=sharedvol:\mysql\data --autoclose
```
 - 6b** The unload script specifies how the application or resource should terminate. Add the following at the beginning of the unload script:


```
mysqladmin shutdown -h a.b.c.d -u root -ppassword --autoclose
```

where `a.b.c.d` = shared IP address
- 7** Bring the cluster resource online.

MySQL is now configured to work in the active/passive clustering mode on NetWare.

3.3 Configuring MySQL on a OES 2 SP1 Linux Cluster

MySQL on OES 2 SP1 Linux can be configured to run on cluster enabled Linux file system partitions and also on NSS file system partitions.

3.3.1 Configuring MySQL for NSS File System

To configure MySQL to use the cluster enabled NSS file system partition, do the following

- 1** Create a NSS shared pool and volume on one of the nodes in the cluster, then specify the shared IP address where MySQL service will run.

By default, this shared volume is now mounted and available at the server where it was created at `/media/nss/NSSVOL` where `NSSVOL` is the shared volume.
- 2** Create an eDirectory™ user named `mysql1` by executing the following command:


```
namuseradd -x o=user_context -g cn=admingroup,o=user_context mysql1
```
- 3** Prepare MySQL service to use the shared volume.
 - 3a** Create the required directories in the NSS volume by executing the following commands:


```
mkdir /media/nss/NSSVOL/mysql
mkdir /media/nss/NSSVOL/mysql/data
```

3b Copy the `\etc\my.cnf` configuration file to `/media/nss/NSSVOL/mysql`.

3c Edit the `/media/nss/NSSVOL/mysql/my.cnf` file and comment out the following entry:

```
datadir=
```

3d Make the `my.cnf` read-only file using the following command:

```
attrib -s=ro,ex /media/nss/NSSVOL/mysql/my.cnf
```

3e Assign appropriate rights to the `mysql` folder by executing the following command:

```
rights -f /media/nss/NSSVOL/mysql -r rwcf trustee  
mysql1.user_context.treename
```

3f Execute the following commands as a root user:

```
chown -R mysql1 /usr/share/mysql  
chown -R mysql1 /var/lib/mysql
```

4 (Optional) If migrating `datadir`, skip this step and go to **Step 5**, otherwise, execute the following:

```
mysql_install_db --datadir=/media/nss/NSSVOL/mysql/data --user=mysql1
```

5 Go to *iManager* > *Cluster* > *Cluster Config*, then edit the load and unload script for the following cluster volume resource object.

Load Script :

The load script specifies the commands to start the MySQL service with the `datadir` on the shared volume. For example, the modified load script will be similar to the following sample:

```
#!/bin/bash  
. /opt/novell/ncs/lib/ncsfuncs  
# mount the NSS volume and add secondary IP address  
exit_on_error nss /poolact=NSSPOOL  
exit_on_error ncpcon mount NSSVOL=254  
exit_on_error add_secondary_ipaddress a.b.c.d  
exit_on_error ncpcon bind --ncpservname=TESTCLUST_IPOOL_SERVER --  
ipaddress=a.b.c.d  
# start the service  
echo "Starting MySQL server ..."  
exit_on_error startproc -v /usr/bin/mysqld_safe --defaults-file=/media  
/nss/NSSVOL/mysql/my.cnf --datadir=/media/nss/NSSVOL/mysql/data --bind-  
address=a.b.c.d --user=mysql1 > /dev/null 2>&1  
echo "Sucessfully started MySQL server"  
# return status  
exit 0
```

Unload Script :

The unload script specifies how the application or resource should terminate. For example, the modified unload script will be similar to the following sample

```
#!/bin/bash  
. /opt/novell/ncs/lib/ncsfuncs  
# stop service  
ignore_error /usr/bin/mysqladmin shutdown --bind-address=a.b.c.d  
-u root -ppassword
```

```

echo "Stopped MySQL server"
sleep 5
# delete the IP address and deactivate NSS volume
ignore_error ncpcon unbind --ncpservername=TESTCLUST_IPOOL_SERVER --
ipaddress=a.b.c.d
ignore_error del_secondary_ipaddress a.b.c.d
ignore_error nss /pooldeact=IPOOL
# return status
exit 0

```

where *a.b.c.d* = clustered POOL IP address

- 6** Bring the resource offline and then bring it online.

MySQL for Linux is now configured to work in the active/passive clustering mode on Linux with its data directory present on a cluster-enabled NSS volume.

3.3.2 Configuring MySQL for Traditional Linux File Systems

The following procedure describes cluster enabling for the REISERFS file system.

You can use the same procedure for EXT2 and EXT3 file systems by replacing the word *reiserfs* with either *ext2* or *ext3*, as applicable.

- 1** Create an REISERFS file system partition of the required size. Do not configure the mount point; leave it blank. If you configure the mount point, an entry is created in *fstab* and the partition is mounted automatically after the system reboots.
Use *fdisk -l* to view the newly created partition. For example, it might be listed as */dev/sdc1*.
- 2** Execute the following commands on the server where you created the partition:

```

mkdir /mnt/mysql
mount -t reiserfs /dev/sdc1 /mnt/mysql
cp /etc/my.cnf /mnt/mysql
mkdir /mnt/mysql/data

```

- 3** Edit the */mnt/mysql/my.cnf* file and comment out the following entry:

```
datadir=
```

- 4** Execute the following commands:

```

chmod 555 /mnt/mysql/my.cnf
chown -R mysql /mnt/mysql
mysql_install_db --datadir=/mnt/mysql/data --user=mysql
chown -R mysql /mnt/mysql/data

```

- 5** Go to *iManager > Cluster > Cluster Config* and create a cluster resource.
Edit the load/unload script of the newly created resource object.

Load Script :

```
#!/bin/bash
. /opt/novell/ncs/lib/ncsfuns
# mount the file system
ignore_error mkdir -p /mnt/mysql
exit_on_error mount -t reiserfs /dev/sdc1 /mnt/mysql
# add the IP address
exit_on_error add_secondary_ipaddress a.b.c.d
# start the service
chown -R mysql /mnt/mysql
echo "Starting MySQL server ..."
exit_on_error startproc -v /usr/bin/mysqld_safe --defaults-file=/mnt/
mysql/my.cnf --datadir=/mnt/mysql/data --bind-address=a.b.c.d --socket=/
mnt/mysql/mysql.sock --user=mysql > /dev/null 2>&1
echo "Sucessfully started MySQL server"
# return status
exit 0
```

Unload Script :

```
#!/bin/bash
. /opt/novell/ncs/lib/ncsfuns
# request service stop
ignore_error /usr/bin/mysqladmin shutdown --socket=/mnt/mysql/mysql.sock
echo "Stopped MySQL server"
sleep 5
# del the IP address
ignore_error del_secondary_ipaddress a.b.c.d
# umount the file system
exit_on_error umount /mnt/mysql
# return status
exit 0
```

MySQL for Linux is now configured to work in the active/passive clustering mode on Linux with its data directory present on a cluster-enabled traditional Linux file system.

Documentation Updates

A

A.1 July 2009

- ♦ Updated the [Section 3.3, “Configuring MySQL on a OES 2 SP1 Linux Cluster,”](#) on page 26

A.2 December 23, 2005

- ♦ Included new section [Using the JDBC Driver with MySQL](#) (page 21)
- ♦ Moved section on [Upgrading a NetWare Server having MySQL 4.1 or later](#) (page 16)
- ♦ Updated the [What's New](#) (page 10) section for OES Support Pack 2.
- ♦ Updated the admin guide to the new template

A.3 August 19, 2005

- ♦ Updated the [What's New](#) (page 10) section for OES Support Pack 1.
- ♦ Added a step in the section [Upgrading a NetWare Server](#) (page 15).
- ♦ Added the chapter on [Configuring MySQL on Novell Clustering Services](#) (page 25)

A.4 May 9, 2005

- ♦ Updated the reference to *Novell Cluster Services 1.7 Resource Configuration Guide*.
- ♦ Added an appendix with Documentation Updates information.

