

# Novell NetWare® 6.5

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MYSQL\* ADMINISTRATION GUIDE

July 15, 2003



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U.S. Patent No. 5,157,663; 5,349,642; 5,455,932; 5,553,139; 5,553,143; 5,572,528; 5,594,863; 5,608,903; 5,633,931; 5,652,854; 5,671,414; 5,677,851; 5,692,129; 5,701,459; 5,717,912; 5,758,069; 5,758,344; 5,781,724; 5,781,733; 5,784,560; 5,787,439; 5,818,936; 5,828,882; 5,832,274; 5,832,275; 5,832,483; 5,832,487; 5,859,978; 5,870,561; 5,870,739; 5,873,079; 5,878,415; 5,884,304; 5,893,118; 5,903,650; 5,903,720; 5,905,860; 5,910,803; 5,913,025; 5,913,209; 5,915,253; 5,925,108; 5,933,503; 5,933,826; 5,946,002; 5,946,467; 5,956,718; 5,956,745; 5,964,872; 5,974,474; 5,983,223; 5,983,234; 5,987,471; 5,991,810; 6,002,398; 6,014,667; 6,016,499; 6,023,586; 6,029,247; 6,052,724; 6,061,726; 6,061,740; 6,061,743; 6,065,017; 6,081,774; 6,081,814; 6,094,672; 6,098,090; 6,105,062; 6,105,069; 6,105,132; 6,115,039; 6,119,122; 6,144,959; 6,151,688; 6,157,925; 6,167,393; 6,173,289; 6,216,123; 6,219,652; 6,233,859; 6,247,149; 6,269,391; 6,286,010; 6,308,181; 6,314,520; 6,324,670; 6,338,112; 6,345,266; 6,353,898; 6,424,976; 6,466,944; 6,477,583; 6,477,648; 6,484,186; 6,496,865; 6,510,450; 6,516,325; 6,519,610; 6,532,451; 6,532,491; 6,539,381; RE37,178. Patents Pending.

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MySQL Administration Guide for NetWare 6.5

[July 15, 2003](#)

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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. 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.

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 7
- ♦ Chapter 2, “Installing and Configuring MySQL,” on page 13

## Additional Documentation

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

For MySQL training documentation, visit <http://www.mysql.com/training> (<http://www.mysql.com/training>).

## Documentation Conventions

In this documentation, a trademark symbol (®, ™, etc.) denotes a Novell trademark. An asterisk (\*) denotes a third-party trademark.

MySQL commands are presented using the conventions found in the [MySQL documentation \(http://www.mysql.com/documentation/mysql/bychapter/manual\\_Introduction.html#Manual\\_conventions\)](http://www.mysql.com/documentation/mysql/bychapter/manual_Introduction.html#Manual_conventions).



# 1

## Overview: MySQL

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:

- ♦ “About MySQL” on page 7
- ♦ “MySQL Architecture” on page 8
- ♦ “Benefits of MySQL” on page 7
- ♦ “Putting MySQL to Work: Web Database Applications” on page 9
- ♦ “Additional MySQL Resources” on page 10
- ♦ “What’s Next” on page 11

## 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.

## Benefits of MySQL

Whether you are a Web developer, CNE<sup>SM</sup>, 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.

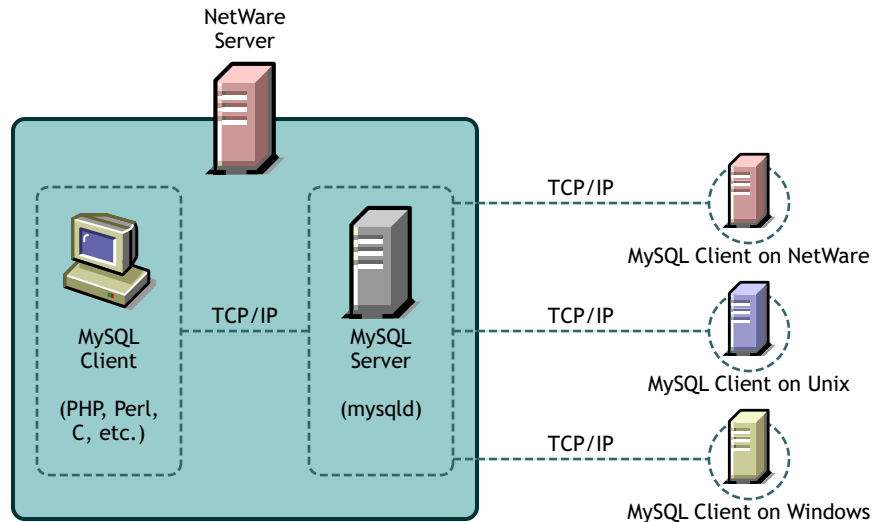
Some of its advantages include the following:

- ♦ *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 either individuals or groups. Passwords are encrypted.
- ♦ *It's inexpensive:* MySQL is included for free with NetWare® 6.5 and available by free download from [www.mysql.com](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 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.

## MySQL Architecture

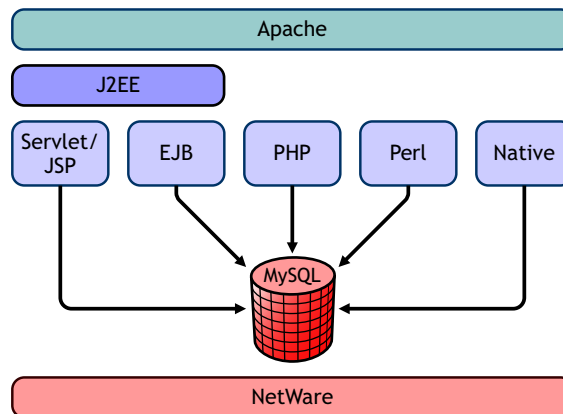
MySQL runs over TCP/IP, making it highly accessible and capable of integrating into a Web environment. Clients across multiple platforms can access MySQL databases through the use of scripting languages such as PHP or Perl, or C.





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.

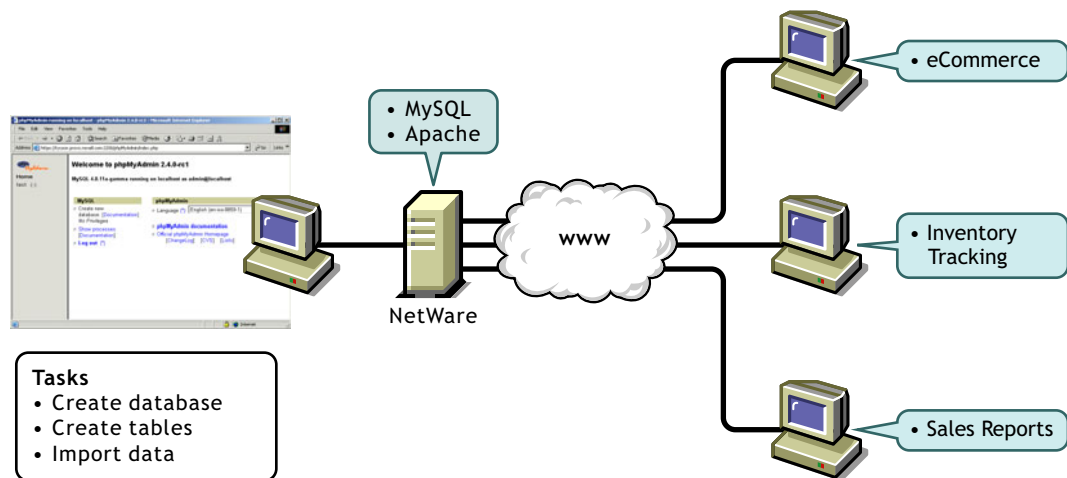
When you install the Web components included with NetWare, NetWare 6.5 is J2EE\* compliant.



## 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. PHP issues commands to the MySQL server, which runs constantly, listening for commands and then manipulating the database accordingly, much like a Web server.



Therefore, 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.

**HINT:** 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*.

## 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 Training

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

- ♦ Developing Dynamic Web Applications with MySQL and PHP
- ♦ Using and Managing MySQL
- ♦ Managing MySQL
- ♦ Storing Sensitive Information with MySQL

To access MySQL training, visit <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>). 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>).

## What's Next

For information about installing MySQL and using it on the NetWare platform, see **Chapter 2, “Installing and Configuring MySQL,”** on page 13.

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



# 2

## Installing and Configuring MySQL

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) Pre-Configured server. 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:

- ♦ [“Before Installing MySQL” on page 13](#)
- ♦ [“Installing MySQL” on page 15](#)
- ♦ [“Manually Starting MySQL and Setting the Root Password” on page 16](#)
- ♦ [“Testing MySQL Using PHP” on page 17](#)
- ♦ [“About Using MySQL with Novell Cluster Services for High Availability” on page 18](#)
- ♦ [“Using the JDBC Driver with MySQL” on page 17](#)
- ♦ [“Uninstalling MySQL” on page 18](#)
- ♦ [“What's Next” on page 18](#)

### 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 [“About Installing MySQL As Part of NetWare AMP” on page 16](#) for specific information about changes made to your server during installation.

### When 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.

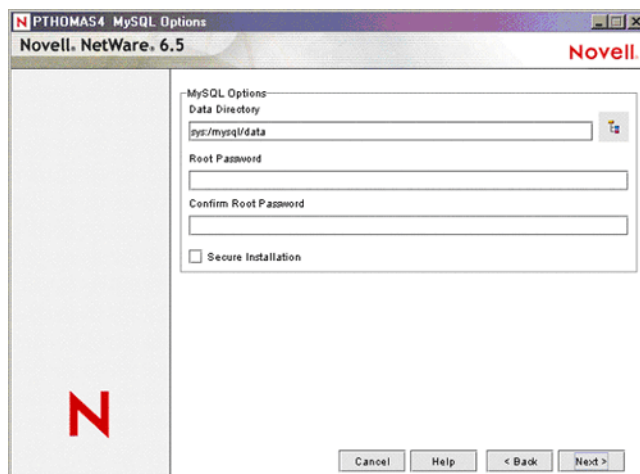
**HINT:** If you are installing the Novell® exteNd™ Application Server, MySQL is also installed. This is because MySQL is required by the exteNd Application Server. Therefore, these same issues apply.

## 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. By default, MySQL does not assign a root password. We recommend that you assign one, especially if you are installing MySQL on a production server.

**WARNING:** If no root password is assigned, anyone can connect as "root" without a password and be granted all privileges. On a production server, we strongly recommend that a password be assigned for the MySQL root user. It can be specified from the MySQL Options screen during installation, or at anytime after installation by following instructions in the MySQL documentation. (See [4.3.4 Setting Up the Initial MySQL Privileges \(http://www.mysql.com/doc/en/Default\\_privileges.html\)](http://www.mysql.com/doc/en/Default_privileges.html) on the MySQL Documentation Web site.)



### About the Secure Installation Check Box

By default, 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. The anonymous user can perform any function on any databases named "test" or whose name begins with "test\_". 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.

By checking the Secure Installation check box, the MySQL install

- ♦ Requires a root password before proceeding

- ♦ Creates the initial MySQL database and configures it so that only the root user is allowed to connect to it, and only from the local host
- ♦ Does not create the anonymous user or a test database

**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.

## 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.

**IMPORTANT:** If you cancel the installation of MySQL after its files have already been copied to the server and then attempt to install MySQL again, the MySQL Options screen that normally appears during installation will not be displayed. This is because when the files were copied during the first installation attempt, the default volume:\etc\my.cnf configuration file was also copied. When the install finds this file on the second attempt, it assumes MySQL was previously installed and so does not display the MySQL Options screen.

To solve this issue, delete the my.cnf file before you attempt to install MySQL again.

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	<p>Select NetWare AMP (Apache, MySQL, PHP, Perl) Server from the Pre-configured Servers list during the NetWare 6.5 installation.</p> <p>This option installs Apache Web Server 2.0, MySQL 4.0, and the PHP and Perl scripting engines.</p>
Add MySQL as a component to your customized NetWare 6.5 installation, which you can use to create, manage, and host databases	<p>Select MySQL from the Components list when selecting the Customized NetWare Server option.</p> <p>This option installs MySQL 4.0.</p>
Install MySQL after installing NetWare 6.5	<p>Run the NetWare post-install program from the NetWare GUI and select MySQL.</p> <p><b>HINT:</b> You can also install MySQL remotely using the NetWare Deployment Manager.</p> <p>This option installs MySQL 4.0.</p>

For information about removing MySQL from your server, see [“Uninstalling MySQL” on page 18](#).

## About Installing MySQL 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.

## Installing MySQL

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

## 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.



# Testing MySQL Using PHP

Once MySQL is installed, you can verify that it is working by running a PHP file from a Web browser. However, first verify that PHP is properly configured in the Apache configuration file.

## To verify that PHP is included in the Apache configuration file:

- 1 Open the `sys:\Apache2\conf\httpd.conf` file.
- 2 If it is not already included, add the following command at the end of the file:  

```
include SYS:\Apache2\conf\mod_php.conf
```
- 3 Save the file and exit.
- 4 Restart the Apache Web server by entering **Apache2 restart** at the system console.  
Using the **restart** command does not unload Apache, but simply rereads the `httpd.conf` file. This allows uninterrupted service for users of your Web sites.

## To test MySQL using a PHP file:

- 1 Copy the `SYS:\PHP\webdemo\phpinfo.php` file to the `SYS:\Apache2\htdocs` directory.
- 2 Restart the Apache Web server by entering **Apache2 restart** at the system console.  
Using the **restart** command does not unload Apache, but simply rereads the `httpd.conf` file. This allows uninterrupted service for users of your Web sites.
- 3 From a Web browser on a client computer, enter the URL of your Apache Web server, specifying `phpinfo.php`. For example:

```
http://www.myserver.com/phpinfo.php
```

# Using the JDBC Driver with MySQL

If you have installed the JDBC driver for use with MySQL, 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` driver 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 located at `sys:\mysql\java`. The readme is contained in the driver's ZIP file.

# Uninstalling MySQL

- 1 If the MySQL server is running, run `mysqladmin shutdown` or `unload mysqld` 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 Once 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.

**HINT:** 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 [“When Upgrading a NetWare Server” on page 13](#).

## About Using MySQL with Novell Cluster Services for High Availability

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.

Using MySQL with NCS requires that you first successfully install and configure NCS and then set up MySQL to work in the NCS environment. For information about how to set up MySQL with NCS, see [Novell Cluster Services Resource Configuration Guide](#).

## What's Next

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