MySQL Notifier

Abstract

This is the MySQL™ Notifier Reference Manual. It documents the MySQL Notifier 1.1 release series.

End of Product Lifecycle. MySQL Notifier is now covered under Oracle Lifetime Sustaining Support. For more information, see https://www.mysql.com/support/eol-notice.html.

For notes detailing the changes in each release, see the MySQL Notifier Release Notes.

For legal information, see the Legal Notices.

For help with using MySQL, please visit the MySQL Forums, where you can discuss your issues with other MySQL users.

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Chapter 1 MySQL Notifier Overview

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MySQL Notifier is a tool that enables you to monitor and adjust the status of your local and remote MySQL server instances through an indicator that resides in the Microsoft Windows taskbar. MySQL Notifier also gives quick access to MySQL Workbench through its context menu. For convenience, MySQL Notifier can be configured to start automatically each time Microsoft Windows is started.

To install, download and execute the MySQL Notifier MSI file.

For notes detailing the changes in each release of MySQL Notifier, see the MySQL Notifier Release Notes.

Visit the MySQL Notifier forum for additional MySQL Notifier help and support.

Features Include:

- Start, stop, and restart instances of the MySQL server.
- Automatically detects (and adds) new MySQL server services. These are listed under Manage Monitored Items, and may also be configured.
- The Tray icon changes, depending on the status. It is a right-pointing green triangle if all monitored MySQL server instances are running or a red square if at least one service is stopped. The Update MySQL Notifier tray icon based on service status option, which dictates this behavior, is enabled by default for each service.
- Links to other applications like MySQL Workbench, MySQL Installer, and the MySQL Utilities. For
 example, choosing Manage Instance will load the MySQL Workbench Server Administration window for
 that particular instance.
- If MySQL Workbench is also installed, then the **Manage Instance** and **SQL Editor** options are available for local (but not remote) MySQL instances.
- Monitors both local and remote MySQL instances.

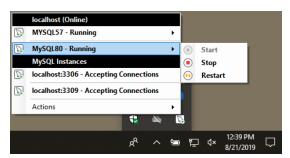
1.1 MySQL Notifier Tasks

MySQL Notifier provides visual status information for the MySQL servers that are monitored on both local or remote computers. The MySQL Notifier icon in the taskbar changes color to indicate the current status: Running or Stopped.

MySQL Notifier automatically adds discovered MySQL services on the local computer. By default, the **Automatically add new services whose name contains** option is enabled and set to mysql. Related notification options include being notified when new services are either discovered or experience status changes, and are also enabled by default. Uninstalling a service removes the service from MySQL Notifier.

Clicking the MySQL Notifier icon from the Windows taskbar reveals the MySQL Notifier main menu, which lists each MySQL server separately and displays its current status. You can start, stop, or restart each MySQL server from the menu as the following figure shows. When MySQL Workbench is installed locally, the **Manage Instance** and **SQL Editor** menu items start the application.

Figure 1.1 MySQL Notifier Service Instance Menu



The **Actions** menu includes the following items:

- Manage Monitored Items
- Launch MySQL Installer (Only when the product is installed.)
- Check for Updates (Only when MySQL Installer is installed.)
- MySQL Utilities Shell (Only when the product is installed.)
- · Refresh Status
- Options
- About
- Close MySQL Notifier

The main menu does not show the **Actions** menu when there are no services being monitored by MySQL Notifier.

1.2 MySQL Notifier Options

The **Actions**, **Options** menu provides a set of options that configure MySQL Notifier operations. Options are grouped into the following categories: **General Options**, **Notification Options**, and **MySQL Server Connections Options**.

Click **Accept** to enable the selected options or **Cancel** to ignore all changes. Click **Reset to Defaults** and then **Accept** to apply default option values.

General Options. This group includes:

- Use colorful status icons: Enables a colorful style of icons for the tray of MySQL Notifier. Selected by default.
- Run at Windows Startup: Allows the application to be loaded when Microsoft Windows starts.
 Deselected by default.
- Automatically Check For Updates Every # Days: Checks for a new version of MySQL Notifier, and runs this check every # days (1 to 365). This configurable option is enabled by default.

- Automatically add new services whose name contains: The text used to filter services and add
 them automatically to the monitored list of the local computer running MySQL Notifier and on remote
 computers already monitoring Windows services. Selected by default for names containing mysql.
- Ping monitored MySQL Server instances every # seconds: The interval (in seconds) to ping
 monitored MySQL Server instances for status changes. Longer intervals might be necessary if the list of
 monitored remote instances is large. 30 seconds by default.

Notification Options. This group includes:

- **Notify me when a service is automatically added**: Display a balloon notification from the taskbar when a newly discovered service is added to the monitored services list. Selected by default.
- Notify me when a service changes status: Displays a balloon notification from the taskbar when a
 monitored service changes its status. Selected by default.

MySQL Server Connections Options. This group includes:

 Automatic connections migration delayed until: When there are connections to migrate to MySQL Workbench (if installed), this option postpones the migration by one hour, one day, one week, one month, or indefinitely.

1.3 Managing Monitored Items

Manage Monitored Items in the **Actions** menu enables you to add, configure, and delete the services and MySQL instances you intend to monitor. The Manage Items window has two tabs: **Services** and **Instances**. This section describes the following aspects of Managed Items window:

- Services Tab
- Instances Tab
- MySQL Server Connections

Services Tab

When MySQL is configured as a local service, MySQL Notifier adds the service to the **Services** tab automatically. With the **Services** tab open, you can select the following options that apply to all services being monitored:

- · Notify me when status changes
- Update MySQL Notifier tray icon based on service status

The next figure shows the Monitored Items windows with the **Services** tab open. This tab lists the service name, the computer where the service is hosted, and the current status of each service monitored by MySQL Notifier.

Manage Items Manage Monitored Items Windows Services and MySQL Instances Local MySQL services will be automatically added. Click Add to monitor other Windows services or MySQL instances. Services Instances Add... Status Name Running On MYSQL57 Running localhost Delete MySQL80 localhost Running Options ✓ Notify me when status changes ✓ Update MySQL Notifier tray icon based on service status Monitor MySQL Instance status every

Figure 1.2 MySQL Notifier: Manage Monitored Services

To stop monitoring a service, select it from the list of monitored services and click Delete.

To begin monitoring a service, click **Add** to open the Add Service window. Select a computer from the drop-down list, locate and select the service to be monitored from the list, and then click **OK**. Use the **Filter** field to reduce the set of services in the list or select **Only show services that match auto-add filter** to reuse the general-options filter from the **Options** menu.

Close

A variety of Windows services (including MySQL) may be selected as the following figure shows. In addition to the service name, the list shows the current status of each Windows services for the selected computer.

Add Service Choose a Machine: Select the machine you want to monitor services on. The machines need to be on your local network. Computer: Local Edit Delete Choose a Windows Service: Select the service you want to monitor. You can filter the list by typing into the filter control. Filter: Only show services that match auto-add filter Display Name Status ActiveX Installer (AxInstSV) Stopped Adobe Acrobat Update Service Running Stopped AllJoyn Router Service Alps HID Monitor Service Running App Readiness Stopped Application Identity Stopped Application Information Running Application Layer Gateway Service Stopped **Application Management** Stopped AppX Deployment Service (AppXSVC) Running ASP.NET State Service Stopped AssignedAccessManager Service Stopped Auto Time Zone Updater Stopped OK Cancel

Figure 1.3 MySQL Notifier: Add New Services

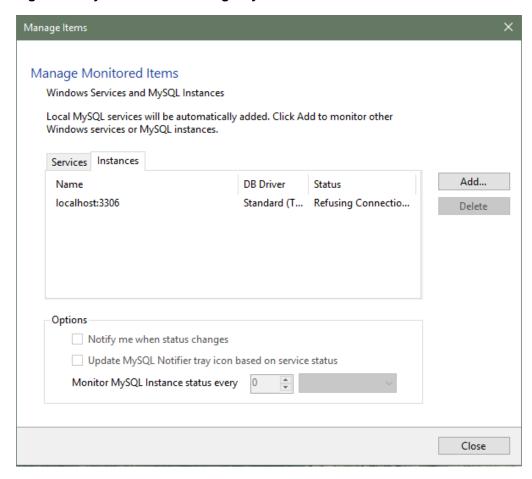
Instances Tab

When MySQL is configured as a MySQL instance, MySQL Notifier adds the instance to the **Instances** tab automatically. With the **Instances** tab open, you can select the following options that apply to each instance being monitored:

- · Notify me when status changes
- Update MySQL Notifier tray icon based on service status
- Monitor MySQL Instance status every [#] [seconds | minutes | hours | days]

The next figure shows the **Instances** tab open and both options selected. Monitoring the instance status is set to every two minutes in this example. This tab shows the instance name, the database driver, and the current status of the instance.

Figure 1.4 MySQL Notifier: Manage MySQL Instances



To stop monitoring an instance, select it from the list of monitored MySQL instances and click **Delete**.

To begin monitoring an instance, click **Add** to open the Monitor MySQL Server Instance window. Use the **Filter** field to reduce the set of instances in the list or select **Show MySQL instances already being monitored** to show monitored items only.

Optionally, you can select a connection from MySQL Workbench to monitor. Click **Add New Connection**, shown in the next figure, to create a new connection.

Choose a MySQL Server connection:

Select a connection from MySQL Workbench that you want to monitor. You can filter the list by typing into the filter control.

Filter: Show MySQL instances already being monitored

Type Name Host Port Monitored Standard (TCP/I... Local instance MySQL80 localhost 3306 No

Figure 1.5 MySQL Notifier: Adding New Instances

MySQL Server Connections

New server connections are configured in the MySQL Server Connection window. Connection names must be unique. An alert icon (!) indicates that an option value is required. The figure that follows shows the MySQL Server Connection window with the **Parameters** tab selected.

MySQL Server Connection Connection Name: Type a name for the connection Method to use to connect to the RDBMS Connection Method: Standard (TCP/IP) Connection Status: 2 Unknown Parameters SSL Advanced Hostname: localhost 3306 Name or IP address of the server host - TCP/IP port. Username: Name of the user on the connection. The user's password, stored in a secured vault. Default Schema: The default schema, leave blank to select it later. Test Connection Cancel

Figure 1.6 MySQL Notifier: MySQL Server Connection

For each connection, provide the connection details, click **Test Connection** to confirm the MySQL connection is valid, and click **OK** to save the new connection. The type of connection you create can vary depending on the configuration of the server, the client host computer, and the level of security you want. MySQL Notifier supports the following connection types:

Basic connections. A basic connection is either unencrypted or encrypted (in MySQL 8.0, SSL is enabled by default) and the connection is made using standard TPC/IP, which is the default connection method in MySQL Notifier to connect to the MySQL RDBMS. Basic connections are easy to configure, particularly if MySQL Notifier and the MySQL server are on the same host computer or operate within the same local area network. To configure a basic connection, set the **Connection Method** option to TCP/IP (standard) and use the **Parameters** tab to configure the connection.

SSL connections. Both the MySQL server and the client must be configured to enable SSL encryption (see Using Encrypted Connections). To configure this type of connection, set the **Connection Method** option to TCP/IP (standard) and use the **Parameters** tab to configure the basic connection. Next, select the **SSL** tab to identify the appropriate files. MySQL Server uses the PEM format for certificates and private keys. In addition to providing the paths to certificate files, you can specify the SSL mode to use for your connection. The following table describes each **Use SSL** option value and indicates which files are required.

Table 1.1 Use SSL Option Values

Option value	Description
No	Do not use SSL. No SSL files are required.
	Use SSL if the server supports it, but allow connection in all cases. No SSL files are required; however, providing the SSL CA file is the best practice for connections made to MySQL 8.0 servers.

Option value	Description
Require	Always use SSL and deny a connection if the server does not support SSL. Do not perform server certificate validation. No SSL files are required.
Require and Verify CA	Always use SSL. Validate the certificate authorities (CA), but tolerate a name mismatch. Requires the SSL CA file.
Require and Verify Identity	Always use SSL and fail if the host name is not correct. Requires valid SSL CA, SSL Cert, and SSL Key files.

SSH connections. SSH tunnels permit you to connect to a MySQL database from behind a firewall when the MySQL server port is blocked. To configure this type of connection, set the **Connection Method** option to Standard TCP/IP over SSH and use the **Parameters** tab to configure the connection.

Additional considerations:

- The SSH server communicates with a MySQL server instance in an unencrypted or encrypted mode, based on the value selected for the SSL mode (see Table 1.1, "Use SSL Option Values"). Select the SSL tab to specify a value for the Use SSL option.
- The account you use to run MySQL Notifier must be authorized on the SSH server in advance. To
 authenticate your account (specified by SSH User Name), you can use one of the following strategies:
 - SSH User Name and SSH Password only
 - SSH User Name and SSH Key File only

Your SSH server may require that you to also provide the SSH Passphrase property when using a key file. An invalid pass phrase generates an exception.

• SSH User Name and SSH Key File (SSH Passphrase) and SSH Password

The combination of user name + key file (passphrase) + password can perform fallback authentication when the key file and pass phrase are valid, but an error occurs on the server. Specifically, the first attempt to connect uses the key file, and if it fails, the next attempt to connect uses the password instead. If the SSH key file is null or empty, but the SSH password is provided, MySQL Notifier attempts to connect using the SSH password only.

1.4 Troubleshooting

For issues that are not documented here, visit the MySQL Notifier Support Forum for MySQL Notifier help and support.

• *Problem*: attempting to start/stop/restart a MySQL service might generate an error similar to "The Service **MySQL**version failed the most recent status change request with the message "The service **mysql**version" was not found in the Windows Services".

Explanation: this is a case-sensitivity issue, in that the service name is **MySQL**VERSION compared to having **mysql**VERSION in the configuration file.

Solution: either update your MySQL Notifier configuration file with the correct information, or stop MySQL Notifier and delete this configuration file. The MySQL Notifier configuration file is located at %APPDATA %\Oracle\MySQL Notifier\settings.config where %APPDATA% is a variable and depends on your system. A typical location is "C:\Users\YourUsername\AppData\Roaming\Oracle\MySQL Notifier \settings.config" where YourUsername is your system user name. In this file, and within the ServerList

section, change the ServerName values from lowercase to the actual service names. For example, change **mysqlversion** to **MySQLversion**, save, and then restart MySQL Notifier. Alternatively, stop MySQL Notifier, delete this file, then restart MySQL Notifier.

 Problem: when connecting to a remote computer for the purpose of monitoring a remote Windows service, the Add Service window does not always show all the services shown in the Windows Services console.

Explanation: this behavior is governed by the operating system and the outcome is expected when working with nondomain user accounts. For a complete description of the behavior, see the User Account Control and WMI article from Microsoft.

Solution: when the remote computer is in a compatible domain, it is recommended that domain user accounts are used to connect through WMI to a remote computer. For detailed setup instructions using WMI, see Chapter 2, Setting Up Remote Monitoring in MySQL Notifier.

Alternatively, when domain user accounts are not available, Microsoft provides a less secure workaround that should only be implemented with caution. For more information, see the Description of User Account Control and remote restrictions in Windows Vista KB article from Microsoft.

Chapter 2 Setting Up Remote Monitoring in MySQL Notifier

MySQL Notifier uses Windows Management Instrumentation (WMI) to manage and monitor services on remote computers. This section explains how it works and how to set up your system to monitor remote MySQL instances.

In order to configure WMI, it is important to understand that the underlying Distributed Component Object Model (DCOM) architecture is doing the WMI work. Specifically, MySQL Notifier is using asynchronous notification queries on remote Microsoft Windows hosts as .NET events. These events send an asynchronous callback to the computer running MySQL Notifier so it knows when a service status has changed on the remote computer. Asynchronous notifications offer the best performance compared to semisynchronous notifications or synchronous notifications that use timers.

As the following figure shows, asynchronous notification requires the remote computer to send a callback to the client computer (thus opening a reverse connection), so the Windows Firewall and DCOM settings must be properly configured for the communication to function properly. The client (Computer A), which includes an unsecured application (unsecapp.exe in this example), makes an asynchronous call to a remote computer (Computer B) and receives a call back with data.

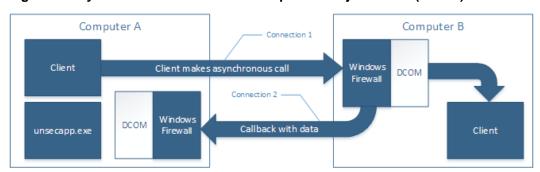


Figure 2.1 MySQL Notifier Distributed Component Object Model (DCOM)

Most of the common errors thrown by asynchronous WMI notifications are related to Windows Firewall blocking the communication, or to DCOM / WMI settings not being set up properly. For a list of common errors with solutions, see Common Errors.

The following steps are required to make WMI function. These steps are divided between two machines. A single host computer that runs MySQL Notifier (Computer A), and multiple remote machines that are being monitored (Computer B).

Computer running MySQL Notifier (Computer A)

1. Enable remote administration by either editing the **Group Policy Editor**, or using NETSH:

Using the Group Policy Editor:

- a. Click Start, click Run, type GPEDIT. MSC, and then click OK.
- b. Under the Local Computer Policy heading, expand Computer Configuration.
- c. Expand Administrative Templates, then Network, Network Connections, and then Windows Firewall.
- d. If the computer is in the domain, then double-click **Domain Profile**; otherwise, double-click **Standard Profile**.

- e. Double-click **Windows Firewall: Allow inbound remote administration exception** to open a configuration window.
- f. Check the **Enabled** option button and then click **OK**.

Using the NETSH command:



Note

The "netsh firewall" command is deprecated as of Microsoft Server 2008 and Vista, and replaced with "netsh advfirewall firewall".

- a. Open a command prompt window with Administrative rights (you can right-click the Command Prompt icon and select **Run as Administrator**).
- b. Execute the following command:

NETSH advfirewall firewall set service RemoteAdmin enable

- 2. Open the DCOM port TCP 135:
 - a. Open a command prompt window with Administrative rights (you can right-click the Command Prompt icon and select **Run as Administrator**).
 - b. Execute the following command:

NETSH advfirewall firewall add rule name=DCOM_TCP135 protocol=TCP localport=135 dir=in action=allow

3. Add the client application that contains the sink for the callback (MySqlNotifier.exe) to the Windows Firewall Exceptions List (use either the Windows Firewall configuration or NETSH):

Using the Windows Firewall configuration:

- a. In the Control Panel, double-click Windows Firewall.
- b. In the Windows Firewall window, click Allow a program or feature through Windows Firewall.
- c. In the Allowed Programs window, click Change Settings and do one of the following:
 - If MySqlNotifier.exe is in the Allowed programs and features list, make sure it is checked for the type of networks the computer connects to (Private, Public or both).
 - If MySqlNotifier.exe is not in the list, click Allow another program.
 - i. In the **Add a Program** window, select the MySqlNotifier.exe if it exists in the Programs list, otherwise click **Browse** and go to the directory where MySqlNotifier.exe was installed to select it, then click **Add**.
 - ii. Make sure MySqlNotifier.exe is checked for the type of networks the computer connects to (Private, Public or both).

Using the NETSH command:

- a. Open a command prompt window with Administrative rights (you can right-click the Command Prompt icon and click Run as Administrator).
- b. Execute the following command, where you change "[YOUR_INSTALL_DIRECTORY]":

```
NETSH advfirewall firewall add rule name=MySqlNotifier program=[YOUR_INSTALL_DIRECTORY]\MySqlNotifie
```

- 4. If Computer B is either a member of WORKGROUP or is in a different domain that is untrusted by Computer A, then the callback connection (Connection 2) is created as an Anonymous connection. To grant Anonymous connections DCOM Remote Access permissions:
 - a. Click Start, click Run, type DCOMCNFG, and then click OK.
 - b. In the Component Services dialog box, expand Component Services, expand Computers, and then right-click **My Computer** and click **Properties**.
 - c. In the My Computer Properties dialog box, click the **COM Security** tab.
 - d. Under Access Permissions, click Edit Limits.
 - e. In the Access Permission dialog box, select ANONYMOUS LOGON name in the Group or user names box. In the Allow column under Permissions for User, select Remote Access, and then click OK.

Monitored Remote Computer (Computer B)

If the user account that is logged on to the computer running the MySQL Notifier (Computer A) is a local administrator on the remote computer (Computer B), such that the same account is an administrator on Computer B, you can skip to the "Allow for remote administration" step.

Setting DCOM security to allow a non-administrator user to access a computer remotely:

1. Grant "DCOM remote launch" and activation permissions for a user or group:

- a. Click Start, click Run, type DCOMCNFG, and then click OK.
- b. In the Component Services dialog box, expand Component Services, expand Computers, and then right-click **My Computer** and click **Properties**.
- c. In the My Computer Properties dialog box, click the **COM Security** tab.
- d. Under Launch and Activation Permission, click Edit Limits.
- e. In the **Launch and Activation Permission** dialog box, follow these steps if your name or your group does not appear in the Groups or user names list:
 - i. In the Launch and Activation Permission dialog box, click Add.
 - ii. In the Select Users or Groups dialog box, add your name and the group in the **Enter the object** names to select box, and then click **OK**.
- f. In the Launch and Activation Permission dialog box, select your user and group in the Group or user names box. In the Allow column under Permissions for User, select Remote Launch, select Remote Activation, and then click OK.

Grant DCOM remote access permissions:

- a. Click Start, click Run, type DCOMCNFG, and then click OK.
- b. In the Component Services dialog box, expand Component Services, expand Computers, and then right-click **My Computer** and click **Properties**.
- c. In the My Computer Properties dialog box, click the **COM Security** tab.
- d. Under Access Permissions, click Edit Limits.
- e. In the Access Permission dialog box, select **ANONYMOUS LOGON name** in the Group or user names box. In the Allow column under Permissions for User, select **Remote Access**, and then click **OK**.
- 2. Allowing non-administrator users access to a specific WMI namespace:
 - a. In the Control Panel, double-click Administrative Tools.
 - b. In the Administrative Tools window, double-click Computer Management.
 - c. In the Computer Management window, expand the Services and Applications tree.
 - d. Right-click the WMI Control icon and select Properties.
 - e. In the WMI Control Properties window, click the Security tab.
 - f. In the Security tab, select the namespace and click Security. Root/CIMV2 is a commonly used namespace.
 - g. Locate the appropriate account and check Remote Enable in the Permissions list.

3. Allow for remote administration by either editing the Group Policy Editor or using NETSH:

Using the **Group Policy Editor**:

- a. Click Start, click Run, type GPEDIT.MSC, and then click OK.
- b. Under the Local Computer Policy heading, double-click Computer Configuration.
- c. Double-click **Administrative Templates**, then **Network**, **Network Connections**, and then **Windows Firewall**.
- d. If the computer is in the domain, then double-click **Domain Profile**; otherwise, double-click **Standard Profile**.
- e. Click Windows Firewall: Allow inbound remote administration exception.
- f. On the Action menu either select **Edit**, or double-click the selection from the previous step.
- g. Check the Enabled radio button, and then click OK.

Using the NETSH command:

- a. Open a command prompt window with Administrative rights (you can right-click the Command Prompt icon and click **Run as Administrator**).
- b. Execute the following command:

```
NETSH advfirewall firewall set service RemoteAdmin enable
```

- 4. Confirm that the user account you are logging in with uses the Name value and not the Full Name value:
 - a. In the Control Panel, double-click Administrative Tools.
 - b. In the Administrative Tools window, double-click Computer Management.
 - c. In the Computer Management window, expand the System Tools then Local Users and Groups.
 - d. Click the **Users** node, and on the right side panel locate your user and make sure it uses the **Name** value to connect, and not the **Full Name** value.

Common Errors

- 0x80070005
 - DCOM Security was not configured properly (see Computer B, the Setting DCOM security... step).
 - The remote computer (Computer B) is a member of WORKGROUP or is in a domain that is untrusted by the client computer (Computer A) (see Computer A, the Grant Anonymous connections DCOM Remote Access permissions step).
- 0x8007000E
 - The remote computer (Computer B) is a member of WORKGROUP or is in a domain that is untrusted by the client computer (Computer A) (see Computer A, the Grant Anonymous connections DCOM Remote Access permissions Step).

• 0x80041003

• Access to the remote WMI namespace was not configured properly (see Computer B, the Allowing non-administrator users access to a specific WMI namespace step).

• 0x800706BA

- The DCOM port is not open on the client computers (Computer A) firewall. See the Open the DCOM port TCP 135 step for Computer A.
- The remote computer (Computer B) is inaccessible because its network location is set to Public. Make sure you can access it through the Windows Explorer.