Veritas NetBackup™ for MySQL Administrator's Guide

Windows and Linux

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VERITAS™

Veritas NetBackup™ for MySQL Administrator's Guide

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Chapter 1

Introduction to NetBackup for MySQL Agent

This chapter includes the following topics:

- About NetBackup for MySQL Agent
- Features of NetBackup for MySQL Agent
- The NetBackup for MySQL Agent package
- About the NetBackup for MySQL Agent License

About NetBackup for MySQL Agent

NetBackup for MySQL Agent extends the capabilities of NetBackup to include backup and restore operations of MySQL databases. The agent is located on the NetBackup client and supports the operations on standalone setups. The agent supports MySQL version 5.5.5 and later.

The agent also supports to:

- Validate the backup information.
- Query backups.
- Delete the backup information from the catalog files.
- Redirect restore to a client different from that originally performed the backup.

Note: Ensure that versions of the MySQL agent and NetBackup are same for successful backup and restore operations. If you upgrade NetBackup to newer version, then you must upgrade the agent version also.

NetBackup for MySQL workflow

The agent reads the parameters from the `nbmysql.conf` file and then initiates the operations. The `nbmysql.conf` file includes the parameters that you must set before you run the respective operations.

See "The nbmysql configuration file" on page 16.

The agent communicates with the MySQL database to create a snapshot. The Volume Shadow Copy Services (VSS) for Microsoft Windows or Logical Volume Manager (LVM) for Linux, takes a snapshot of the database.

The agent then interacts with the NetBackup XBSA interface to update the server name, policy, and schedule type information. The NetBackupmaster server connects to the NetBackup client to backup or retrieve the data that you want to protect. The agent mounts the snapshot, copies the file, and sends it to the NetBackup XBSA interface.

The NetBackup XBSA interface writes this data to the mounted media or disk storage managed by the NetBackupmedia server.

Features of NetBackup for MySQL Agent

The Table 1-1 displays the features supported by the NetBackup for MySQL Agent.

Table 1-1 Features supported by NetBackup for MySQL Agent

Features	Description
Backup	The agent supports full instance backup of the MySQLdatabase.
Restore	The agent supports full instance restore of MySQL backups.
Redirected restore	The agent supports to restore MySQL backups to alternate NetBackup clients.

The NetBackup for MySQL Agent package

The agent is packaged in `NBMySQLAgent_8.2.zip` file and is available on my.veritas.com site.

The package file includes the following platform files:

- (Windows) `NBMySQLAgent_8.2_AMD64/`
- (Linux RHEL) `NBMySQLAgent_8.2_linuxR_x86/`
- (Linux SLES) `NBMySQLAgent_8.2_linuxS_x86/`

About the NetBackup for MySQL Agent License

The NetBackup for MySQL Agent is installed on the NetBackup client software and is not a separately licensed option of NetBackup. The NetBackup for MySQL Agent is available to customers who are entitled with a valid license of the Application and Database License Pack. In general, licensing of the NetBackup for MySQL Agent follows the existing capacity licensing models for supported database agents.

Chapter 2

Installing NetBackup for MySQL Agent

This chapter includes the following topics:

- Planning the installation of NetBackup for MySQL Agent
- Verifying the operating systems and the platforms
- Installing prerequisites of NetBackup for MySQL Agent
- Post-installation requirements for NetBackup for MySQL Agent
- Describing the NetBackup for MySQL Agent package
- Installing the NetBackup for MySQL Agent
- Authenticating the password
- Uninstalling the NetBackup for MySQL Agent

Planning the installation of NetBackup for MySQL Agent

Table 2-1 lists the planning steps that are mandatory for installing the NetBackup for MySQL Agent.

Table 2-1 Installation steps for NetBackup for MySQL Agent

Step	Action
Step 1	Verify the operating systems. For more information, See "Verifying the operating systems and the platforms" on page 10.
Step 2	Verify the prerequisites before you install the NetBackup for MySQL Agent. For more information, See "Installing prerequisites of NetBackup for MySQL Agent" on page 10.
Step 3	Install the NetBackup for MySQL Agent on your operating system. For more information, See "Installing the NetBackup for MySQL Agent" on page 13.
Step 4	Authenticate the password for MySQL backups. For more information, See "Authenticating the password" on page 14.

Verifying the operating systems and the platforms

Verify that the NetBackup for MySQL Agent is supported on your operating systems and platforms.

The agent supports the operations on

- Red Hat Enterprise Linux (RHEL) 6.8 and later
- SUSE Enterprise Linux Server 11 SP3 and later
- Microsoft Windows Server 2008 R2 and later
- Microsoft Windows 8.1 and later

Installing prerequisites of NetBackup for MySQL Agent

Verify the following prerequisites before you install the NetBackup for MySQL Agent:

- NetBackup 8.2 and later is installed and operational on the master server, media server, and the client.
- Ensure that versions of the MySQL agent and NetBackup are same. If you upgrade NetBackup to newer version, then you must upgrade the agent version also.

- The MySQL database is installed and operational on the client.
- The MySQL instance is on the InnoDB storage engine.

Post-installation requirements for NetBackup for MySQL Agent

After you install the agent

- (Windows) Configure the NetBackup for MySQL Agent to run with administrative privileges.
- (Windows) Add the `NetBackup bin` directory to the PATH user environment variable.
- (Linux) If the `nbmysql.conf` file does not exist, create the default configuration file. For more information, See "The nbmysql configuration file" on page 16.
- (Linux) The user of the agent is a superuser or have superuser privileges.
- (Linux) Symbolic link: If a symbolic link does not exists, create a symbolic link `libmysqlclient.so` and ensure that it points to `libmysqlclient.so.<n>`, where `n` is the MySQL client library version . You can create the symbolic link at your chosen directory.
  For example, if the MySQL client library version is 18, then the symbolic link `libmysqlclient.so` points to `libmysqlclient.so.18`.

  Note: Ensure that you update the `MYSQL_LIB_INSTALL_PATH` parameter in the `nbmysql.conf` file with the absolute path of the symbolic link.

- Set the following user privileges:

Table 2-2 User privileges

User	Privileges
Backup	LOCK TABLES, SELECT, FILE, RELOAD, SUPER, UPDATE, TRIGGER, SHOW, VIEW, EXECUTE, and EVENT.
Restore	CREATE, DROP, INDEX, SHUTDOWN, INSERT, ALTER, DELETE, UPDATE, TRIGGER, SUPER, and CREATE VIEW.

To set the user privileges, run the following commands:

```
GRANT SELECT, INSERT, UPDATE, CREATE, DROP, RELOAD, SHUTDOWN, FILE,
INDEX, ALTER, SUPER, LOCK TABLES, CREATE VIEW, SHOW VIEW, TRIGGER,
```

```
CREATE ROUTINE, DELETE, EVENT, ALTER ROUTINE ON *.* TO
'USER'@'localhost' IDENTIFIED BY 'PASSWORD'
```

For more information, see *MySQL Administration Guide*

Describing the NetBackup for MySQL Agent package

The agent is packaged in the `NBMySQLAgent_8.2.zip` file and is available on my.veritas.com site.

The package file includes the following platform files:

- (Windows) `NBMySQLAgent_8.2_AMD64/`
- (Linux RHEL) `NBMySQLAgent_8.2_linuxR_x86/`
- (Linux SUSE `NBMySQLAgent_8.2_linuxS_x86/`

The platform files have the following directory structure:

(Windows) `NBMySQLAgent_8.2_AMD64/` includes the following files:

- `NBMySQLAgent_8.2_AMD64/README.txt`
- `NBMySQLAgent_8.2_AMD64/NBMySQLAgent.msi`
- `NBMySQLAgent_8.2_AMD64/Setup.exe`
- `NBMySQLAgent_8.2_AMD64/CAB1.CAB`

(Linux RHEL) `NBMySQLAgent_8.2_linuxR_x86/` includes the following file:

- `VRTSnbmysqlagent.rpm`

(Linux SUSE) `NBMySQLAgent_8.2_linuxS_x86/` includes the following file:

- `VRTSnbmysqlagent.rpm`

When you install the agent, you have to accept the VERITAS LICENSE AGREEMENT, to proceed installing the agent successfully.

The agent by default gets installed at the following locations:

- (Windows) `C:\Program Files\Veritas\NBMySQLAgent`
- (Linux RHEL and SUSE) `/usr/NBMySQLAgent/`

Installing the NetBackup for MySQL Agent

To install the agent on Windows

1. Extract the `NBMySQLAgent_8.2_AMD64/` file contents to your chosen location.
2. Run the `NBMySQLAgent_8.2_AMD64/Setup.exe`.
3. Accept the VERITAS LICENSE AGREEMENT and then click **Finish**.

   The agent gets installed at `C:\Program Files\Veritas\NBMySQLAgent` location.

To install the agent on Linux (RHEL)

1. Extract the `NBMySQLAgent_8.2_linuxR_x86/` file contents to your chosen location.
2. Run the rpm installer `VRTSnbmysqlagent.rpm` using the following command:

   ```
   rpm -ivh VRTSnbmysqlagent.rpm
   ```

3. Type `y` to accept the VERITAS LICENSE AGREEMENT.

   The agent gets installed at `/usr/NBMySQLAgent/` location.

To install the agent on Linux (SUSE)

1. Extract the `NBMySQLAgent_8.2_linuxS_x86/` file contents to your chosen location.
2. Run the rpm installer `VRTSnbmysqlagent.rpm` using the following command:

   ```
   rpm -ivh VRTSnbmysqlagent.rpm
   ```

3. Type `y` to accept the VERITAS LICENSE AGREEMENT.

   The agent gets installed at `/usr/NBMySQLAgent/` location.

Note: Ensure that the MySQL agent and NetBackup are of same version for successful backup and restore operations.

To accept the EULA agreement automatically (silent installation), create a `/tmp/AgentInstallAnswer.conf` file with following content:

Yes - to accept the EULA agreement

No - to decline EULA agreement

Authenticating the password

Authenticating the password keeps you from specifying the password every time you run a backup. The `my.cnf` or the `my.ini` file stores the authentication credentials that the agent reads when it connects to the MySQL server. Make sure that you store the password in the MySQL environment variable.

The MySQL utility to encrypt the password lets you set, reset, and validate the password. The password encryption uses the port number to create a section name that corresponds to the instance to which the password belongs.

In MySQL v5.5.x, it reads the plain text authentication credentials from the MySQL configuration file `my.cnf`. To authenticate, under the client section, edit the `my.cnf`, or `my.ini` file to add the password. For example:

```
[client]
```

port=3306

password= type the password

In MySQL v5.6 and later, it reads the encrypted authentication credentials from the MySQL options `.mylogin.cnf` file.

To authenticate the password

1. (Windows) Run the following command:

   ```
   mysql_config_editor.exe set --port=<portnumber> --password
   ```

   For example, if the `portnumber` is 3306:

   ```
   mysql_config_editor.exe set --port=3306 --password
   ```

2. (Linux) Run the following command:

   ```
   mysql_config_editor set --port=<portnumber> --password
   ```

   For example, if the `portnumber` is 3306:

   ```
   mysql_config_editor set --port=3306 --password
   ```

3. To reset the password, run the command that applies to your operating system:

   - (Windows) `mysql_config_editor.exe reset`
   - (Linux) `mysql_config_editor reset`

4. To validate the password, run the command that applies to your operating system:

   - (Windows) `mysql_config_editor.exe print --all`
   - (Linux) `mysql_config_editor print --all`

Uninstalling the NetBackup for MySQL Agent

To uninstall the agent

1. (Windows) From the **Control Panel**, right-click the `NBMySQLAgent_8.2_AMD64/`file and **Uninstall** the agent.
2. (Linux RHEL or SUSE) To uninstall, run the following command:

   ```
   rpm -e VRTSnbmysqlagent
   ```

Chapter 3

Configuring NetBackup for MySQL Agent

This chapter includes the following topics:

- The nbmysql configuration file
- Configuring the NetBackup for MySQL backups with DataStore policies

The nbmysql configuration file

The configuration file `(nbmysql.conf)` contains the parameters for the respective operations. It contains predefined settings and is located on the client. You can configure the parameters in the `nbmysql.conf` file or provide them on the command line, where the command line parameters take precedence. The `nbmysql.conf` file keeps you from providing the parameters every time you run operations. When parameters are not configured in the `nbmysql.conf` file, then the default parameter value takes precedence.

The `nbmysql.conf` file is located in the following locations:

- (Windows) `install_path\NBMySQLAgent_8.2_AMD64\nbmysql.conf .`
- (Linux (RHEL) `install_path/NBMySQLAgent_8.2_linuxR_x86/nbmysql.conf.`
- (Linux SUSE) `install_path/NBMySQLAgent_8.2_linuxS_x86/nbmysql.conf.`

Creating the nbmysql configuration file

Starting from NetBackup 8.2, the `nbmysql.conf` file is not created by default when you install the agent on RHEL or SUSE. The existing configuration file is prevented from getting overwritten as the RPM installer simply overwrites any existing files in the destination directory `/usr/NBMySQLAgent/`.

If the `nbmysql.conf` file does not exist, you can create the file by running the backup utility command without any options. For example, run the `./nbmysql` command. This command creates the default `nbmysql.conf` file.

Table 3-1 lists the `nbmysql.conf` parameters.

Table 3-1 The nbmysql.conf parameters

Parameters	Description	Required parameter for	Default value
DB_USER	Configures the MySQL database user name.	Backup and restore operations.	When you do not set the database user name, it defaults to `root`.
DB_PORT	Configures the MySQL database server port number on which the backup or the restore has to be performed.	Restore operations	When you do not set the database server port, it defaults to 3306.
DB_HOST	Configures the MySQL database hostname.	Non-LVM restore operations	No default value for this parameter. This parameter must be specified.
MYSQL_LIB_INSTALL_PATH	Configures the `libmysql.dll//libmysqlclient.so` binary path. On Windows, the library directory is at MySQL server installed path. On Linux, run the `libmysqlclient` command to locate the library path.	Backup operations	No default value for this parameter.
NETBACKUP_MASTER_SERVER	Specifies the NetBackup master server to run backups and restores.	Backup operations	No default value for this parameter.
NETBACKUP_POLICY_NAME	Specifies the NetBackup DataStore policy name.	Backup operations	No default value for this parameter.
NETBACKUP_SCHEDULE_NAME	Identifies the backup schedule that you configured while creating the DataStore policy.	Backup operations	No default value for this parameter.
NETBACKUP_CLIENT_NAME	Defines the NetBackup MySQL client name.	Redirected restores and query backups.	When you do not set the NetBackup client, it defaults to the NetBackup master server.

Table 3-1 The nbmysql.conf parameters *(continued)*

Parameters	Description	Required parameter for	Default value
SNAPSHOT_SIZE	(Linux) Specifies the snapshot size in kilobytes, megabytes, or gigabytes as K, M, or G respectively.	LVM backups	When you do not set the snapshot size, it defaults to `MB`.
COPY_ID	Represents the backup image name. You can use this value to query, restore, or delete a specific backup.	To query, restore, or delete a backup using its backup image name.	No default value for this parameter.
MYSQL_TARGET_DIRECTORY	Specifies the destination directory where you want to restore the backups.	Restore backups.	No default value for this parameter.
NBMYSQL_LOG_LEVEL	The **NBMYSQL_LOG_LEVEL** lets you set the logging level for the NetBackup MySQL logs. The default value is 1. For a particular logging level, all details at that level or lower are logged. The MySQL debug logs includes the following verbose levels: ■ **1 – ERROR**: Conditions that should be corrected, such as configuration errors. ■ **2 – WARN**: Conditions that are not errors, but that might require special handling. ■ **3 – INFO**: Informational messages ■ **4 – DEBUG**: Debugging the messages that is used for troubleshooting.	The log levels help to control the amount of information that you want to access, when troubleshooting errors.	When you do not set `nbmysql` log level, it defaults to level 1.
NBMYSQL_LOG_SIZE	Configures the `nbmysql.conf` log size in MB. When the log reaches the specified size, it overwrites the log information.	You can specify the value according to the events that you want to write into the logs.	When you do not specify the `nbmysql` log size, it defaults to 10MB.

Configuring the NetBackup for MySQL backups with DataStore policies

The agent supports the DataStore policies to define the attributes, schedules, clients list, and backup selections.

To configure MySQL database backups with DataStore policies

1. Log on to the master server as an administrator (Windows) or root (Linux).
2. In the **NetBackup Administration Console**, expand **NetBackup Management**, and then click **Policies**.
3. In **All Policies** pane, right-click **Summary of All Policies**, and then click **New Policy**.
4. In **Add a New Policy** dialog box, enter a unique name for the policy.
5. In the **Change Policy** dialog box, select **Data Store Policy** from the **Policy Type** drop-down list.
6. From the **Policy Storage** list, select the **disk-based storage unit** for storage.
7. To select the schedule type, under the **Schedules** tab, click Ok to select the **Application Backup** schedule type.

   Note: The XBSA framework supports the **Application backup** schedule type only.

8. In the **Clients** tab, click **New**, and then add the NetBackup client that has the NetBackup for MySQL Agent.
9. In the **Add Client** screen, click **New**, and then in the **Client Name** field, type the name of the client.
10. In the **NetBackup Administration Console**, click **NetBackup Management**> **Policies** to view the policy in the existing policies list.
11. Verify the parameters in `nbmysql.conf` before you run the backup operation or specify them on the `nbmysql` command line.

    For more information, See "The nbmysql configuration file" on page 16.

Note: Ensure that the MySQL agent and NetBackup are of same version for successful backup and restore operations.

Chapter 4

NetBackup for MySQL backup and restore

This chapter includes the following topics:

- About MySQL database backups
- Performing the MySQL backups
- Validating the backup information
- Querying the MySQLbackups
- Deleting backup information from the NetBackup catalog
- About NetBackup for MySQL restores
- Performing the restores for MySQL databases
- Redirected restores
- Disaster recovery

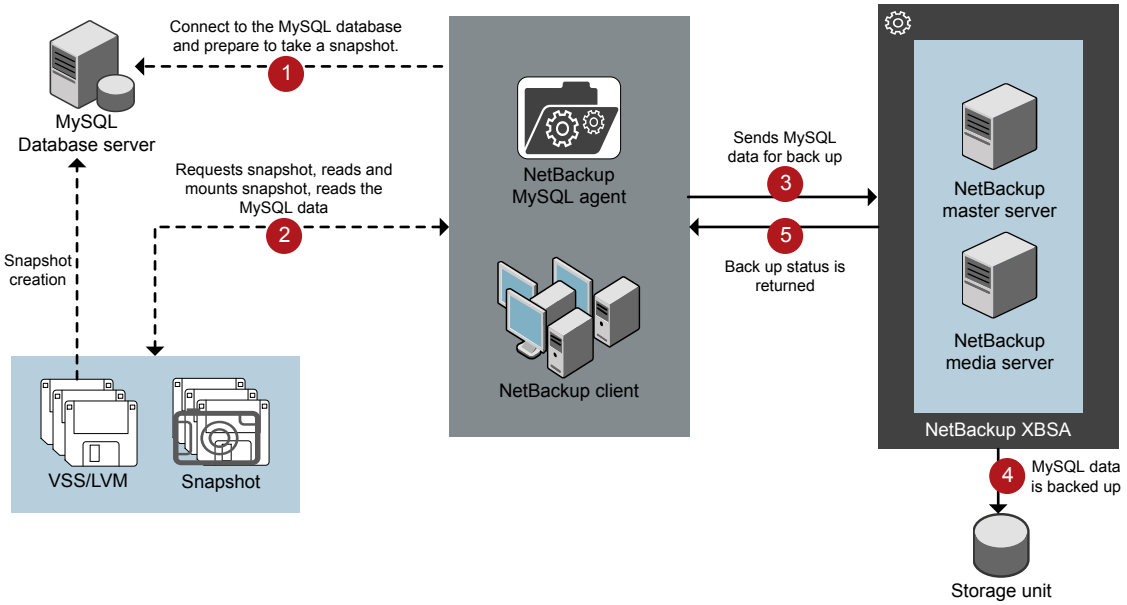
About MySQL database backups

The `nbmysql` command initiates the backup operation using the `-S`, `-P`, `-s` and `-l` as required parameters. The parameter `-z` is the required parameter for LVM configured systems.

The parameter `-p` and `-u` are the optional parameters.

Configure these parameters in the `nbmysql.conf` file or specify on the `nbmysql` command line, where the parameters provided on the command line takes precedence.

Figure 4-1 NetBackup for MySQL backup workflow



Performing the MySQL backups

This topic lists the prerequisites, describes the procedure to run MySQL backups, and the information to schedule the backup from the **NetBackup Administration Console**.

Prerequisites

Before you run the backup, ensure that you meet the following prerequisites.

- Ensure that versions of the MySQL agent and NetBackup are same. If you upgrade NetBackup to newer version, then you must upgrade the agent version also.
- Ensure that the user has administrator (Windows) or root (Linux) access.

- (LVM users) Ensure that the MySQL data and logs directory reside on a single logical volume.
- Configure the **DataStore** policy from the **NetBackup Administration Console**.
- Add the database parameters and library path in the `nbmysql.conf` file.
- Verify that there is enough space for the snapshot in the volume group, and then set the snapshot size in `nbmysql.conf` file or by the command line.

Note: Ensure that the snapshot size is 50% more than the instance size that you want to backup.

- Verify that the prerequisites and the post-installation requirements are met.
  For more information, See "Installing prerequisites of NetBackup for MySQL Agent" on page 10.
  For more information, See "Post-installation requirements for NetBackup for MySQL Agent " on page 11.

To run backup

1 Run the following command:

```
nbmysql -o backup
-S master_server_name
-P policy_name
-s schedule_name
-l mysql_lib_path
-z snapshot_size
[-p database_server_port]
[-u database_username]
```

2 (Optional) Type the password, when the `nbmysql` command line prompts for the password.

Note: Ensure that the MySQL agent and NetBackup are of same version for successful backup and restore operations.

Scheduling MySQL backups from NetBackup

You can schedule MySQL backups from **NetBackup Administration Console** using the **DataStore** policy to call a backup script.

For more information, https://www.veritas.com/support/en_US/article.100041374

Validating the backup information

After a successful MySQL backup, you can list the backups and verify the backup information using the following command:

```
nbmysql -o query
```

Querying the MySQLbackups

The `nbmysql` query command lists the backup files according to the options that you specify. The parameter `-S` is the required parameter. Alternatively, you can use the `-C client_name` and `-P policy_name` options to define a different client and policy.

You can configure the parameters from the `nbmysql.conf` file or set the parameters using the `nbmysql` command. By default, NetBackup uses the values that you have configured in the `nbmysql.conf` file.

For example, to query a backup from the client `ClientA`, run the following command:

```
nbmysql -o query -S master_server_name [-C ClientA]
```

For example, to list backup files with the policy name `policy_name`, run the following command:

```
nbmysql -o query -S master_server_name [-P policy_name]
```

For example, to query a backup from the client `Client A` with policy name `policy_name`, run the following command:

```
nbmysql -o query -S master_server_name [-C ClientA] [-P policy_name]
```

Deleting backup information from the NetBackup catalog

The `nbmysql` delete command, removes the backup information from the catalog files but retains the backup files on the NetBackup media server.

The parameter `-S` is the required parameter. Alternatively you can use the `-i` option to delete a backup using its backup image name.

By default, NetBackup uses the values that you have defined in the `nbmysql.conf` file.

To delete the MySQL backup information

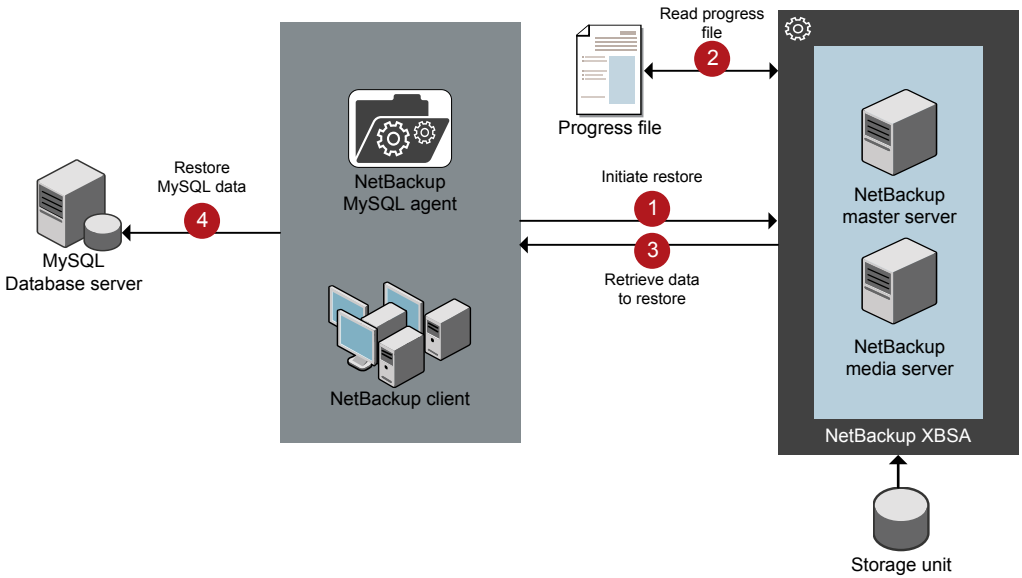
1. Configure the parameters, in the `nbmysql.conf`file or set them on the command line.
2. Run the following command:

   `nbmysql -o delete -S` *`master_server_name`* `[-i` *`copy_id`*`].`

About NetBackup for MySQL restores

When you initiate a restore, the NetBackup XBSA interface reads the progress files to receive the MySQL backup files to restore them to the target directory. Before you run a restore, ensure that the target directory is empty.

Figure 4-2 NetBackup for MySQL restore workflow



The parameter-`S`, `t`, and `-p` are required parameters. Alternatively, you can choose to restore using the optional values `-i` as the backup image name and `-C` to restore from a specified client name.

Note: The restore fails when the target directory is invalid or not empty. Ensure that you delete all contents of the target directory before you initiate the restore operation.

Performing the restores for MySQL databases

This topic lists the prerequisites and describes the procedure to restore the backups.

Note: Ensure that the MySQL agent and NetBackup are of same version for successful backup and restore operations.

Prerequisites

Before you restore the backups, you must meet the following prerequisites:

- Ensure that versions of the MySQL agent and NetBackup are same. If you upgrade NetBackup to newer version, then you must upgrade the agent version also.
- Ensure that the user has administrator (Windows) or root (Linux) access.
- Ensure that you restore the MySQL instance to an empty target directory.
- Ensure that the target directory is a valid instance directory.
- (Non-LVM) Ensure the MySQL services are running.

To restore the backups

1. Configure the parameters in the `nbmysql.conf` file, or specify them using the `nbmysql` command.

   For more information, See "The nbmysql configuration file" on page 16.
2. Verify that the MySQL services are running for Non-LVM restores.
3. Run the following command:

   ```
   nbmysql -o restore -S master_server_name -t target_directory -p
   db_port [-i copy_id] [-C client_name] [-u db_user] [-H db_host]
   ```

   Note: For non-LVM restores, `DB_HOST` and `DB_USER` parameter are also required.

Redirected restores

A redirected restores lets you restore backup files to a client different from the client that originally performed the backup. The new location can be a different host or a different file path using a different name for the redirected restore. To redirect a restore to a different host, include the destination client name in the `install_path\NetBackup\db\altnames` directory.

Note: Ensure that the MySQL agent and NetBackup are of same version for successful backup and restore operations.

Performing redirected restores

To redirect a restore to a different host

1. Update the `nbmysql.conf` file with the NetBackup client name as the host and the MySQL target directory as the directory where you want to redirect the restore.
2. On the NetBackup master server, create an `altnames` directory for the host that you want to have permission to perform the redirected restore. For example, to give Host B permissions to restore from another host, create the following file:
   - (Windows) `install_path\NetBackup\db\altnames\HostB`
   - (Linux RHEL and SLES) `/usr/openv/netbackup/db/altnames/HostB`
3. In the `altnames` directory, add the names of the client(s) whose files the requesting client wants to restore. For example, if you want Host B to have permissions to redirect restores from Host A, add Host A to the Host B file.
4. Run the following command:

   `nbmysql -o restore -S` *`master_server_name`* `-t` *`target_directory`* `-p` *`db_port`* `[-i` *`copy_id`*`] [-C` *`client_name`*`] [-u` *`db_user`*`] [-H` *`db_host`*`]`

   Note: For non-LVM restores, `DB_HOST` and `DB_USER` parameter are also required.

5. After a successful redirected restore, undo the changes that you made on the master server and the client.

To redirect a restore to a different file path

1. Run the following command:

   ```
   nbmysql -o restore -S master_server_name -t target_directory -p
   db_port [-i copy_id] [-C client_name]
   ```

2. After a successful restore, make the following changes:

   - (Linux) To change the ownership of the files and directories to MySQL, run the following command:

     ```
     $chown -R mysql <data_dir>
     $chgrp -R mysql <data_dir>
     ```

3. Copy the restore data to the data directory.

Disaster recovery

Disaster recovery is a plan to recover the data that can get lost in a disaster event. The NetBackup for MySQL Agent uses redirected restore as a disaster recovery strategy.

For more information, See “ Redirected restores ” on page 26.

Chapter 5

Troubleshooting for NetBackup for MySQL

This chapter includes the following topics:

- Troubleshooting errors for the NetBackup for MySQL Agent

Troubleshooting errors for the NetBackup for MySQL Agent

To troubleshoot problems, you can refer to the logs that are specific to NetBackup for MySQL Agent, NetBackup XBSA, or set the verbose logging levels in the `nbmysql.conf` file. The logs are located at the following locations:

The NetBackup logs are located at:

- `install_path\NetBackup\logs\bprd`
- `install_path\NetBackup\logs\bpcd`
- `install_path\NetBackup\logs\user_ops\dbext\logs`

The logs that are specific to NetBackup for MySQL Agent is located at:

`install_path\nbmysql.log`

The logs that are specific to NetBackup XBSA is located at:

`<NetBackup_install_path>/netbackup/logs/exten_client.`

Preliminary steps

Verify the following, before you troubleshoot the problems:

- All the prerequisites are completed.
- All the computers have compatible operating system versions.

- The debug logs and reports are verified for errors.

Troubleshooting NetBackup problems

For troubleshooting NetBackup problems, refer to the *Veritas NetBackup Troubleshooting Guide* and the *Veritas NetBackup Commands Reference Guide*.

Troubleshooting NetBackup for MySQL operations

Table 5-1 Troubleshooting NetBackup for MySQL backups and restores

Problems	Description	Solution
The `nbmysql` backup fails with the following error: *An error has occurred during backup*	The `nbmysql` backup may fail for any of the following reasons: ■ The NetBackup media server or client runs on NetBackup 8.0 or earlier versions. ■ The check box for **Enable in secure communication with NetBackup8.0 and earlier hosts** is disabled ■ The NetBackup host ID certificate that exists on the MySQL client is invalid.	For a successful backup, complete any of the following: ■ Upgrade the media server or client to use NetBackup 8.1 or later versions. ■ In **NetBackup Administration Console**, under **Security Management** > **Global Security Settings**, select the **Enable in secure communication with NetBackup 8.0 and earlier hosts** check box. ■ Verify the NetBackup host ID certificate. You can manually obtain the host ID certificate. For more information, see www.veritas.com/support/en_US/article.000127129
The `nbmysql` agent fails to initiate any operation.	The MySQL agent displays an error that is related to absence of the `I18N` file. You may encounter this problem when you launch the agent.	When the agent fails to initiate operations due to absence of the `I18N` file, copy the language file in the agent installer location and then run the operations.
The `nbmysql` backup fails with the following error: *Unable to load MySQL library*	You may encounter this problem when the `nbmysql.conf` file is not updated with the following: ■ The MySQL library file location. ■ The `MYSQL_LIB_INSTALL_PATH` does not point to `libmysqlclient.so.<n>`	Verify the following and then run the backup again: ■ Add or update the MySQL library file location in the `nbmysql.conf` file. For more information, See "The nbmysql configuration file" on page 16. ■ Ensure that the `MYSQL_LIB_INSTALL_PATH` is set to the absolute path of the symbolic link. ■ Create a symbolic link `libmysqlclient.so` that points to the `libmysqlclient.so.<n>` version. For more information, See "Post-installation requirements for NetBackup for MySQL Agent " on page 11.

Table 5-1 Troubleshooting NetBackup for MySQL backups and restores *(continued)*

Problems	Description	Solution
The `nbysql` backup fails with the following error message: *Unable to connect to the database*	The `nbmysql` backup fails if the `nbmysql.conf` includes an invalid database user name and the port number.	To add the appropriate database user name and port number ■ Configure the appropriate database user name and port number in the `nbmysql.conf` file or provide the appropriate options with the `nbmysql`command. For more information, See "The nbmysql configuration file" on page 16. ■ If the backup fails again, verify if the MySQL services are running.
The `nbmysql` backup fails with the following error: *Unable to load xbsa.dll*	The `nbmysql` backup fails if the environment variable path is not updated with NetBackup bin directory.	To run a MySQL backup successfully ■ Update the environment variable path with `NetBackup_install_path/bin`.
The `nbmysql` backup fails with the following error: *XBSA initiation failed*	The `nbmysql` backup fails if the `nbmysql.conf` file is not updated with the required parameters.	To run the NetBackup backup successfully ■ Configure the valid master server name, policy name, schedule type in the `nbmysql.conf` file or from the command line. For more information, See "The nbmysql configuration file" on page 16. ■ Verify if there are communication errors between the agent and the NetBackup master server. For more information see the *NetBackup Administration guide*.

Table 5-1 Troubleshooting NetBackup for MySQL backups and restores *(continued)*

Problems	Description	Solution

The `nbmysql` backup on Linux (LVM), fails with the following error:
Error unmounting the snapshot-Device or resource busy
OR
Error removing the snapshot-mysqlsnap_<timestamp>
Note: <timestamp> is the LVM snapshot time
	The `nbmysql` backup fails during an attempt to unmount the snapshot, the device, or when you remove the existing snapshots.	To unmount the snapshot
		1 List all mounted file systems using the following command:
		`$ mount-l`
		2 If the snapshot still exists, create a mount directory using the following command:
		`$mount<mount_directory>`
		Note: This directory is created in `/mnt/<snapshot_name>`. The prefix names for snapshot are `mysqlsnap`.
		3 To remove the mount directory run the following command:
		`$rm -rf <mount_directory>`
		4 To remove the snapshot manually run the following command:
		`lvremove -f <volume_group>/<snapshot_name>`

Error messages after a successful backup:
<volume_group>/<snapshot_name> Read failure after 0 of 4096 at 29393616896: input or output error.
OR
<volume_group>/<snapshot_name>: read failure after 0 of 4096 at 4096: input or output error.
	The `nbmysql` backup gives these errors when the volume group contains the snapshots. You can list the snapshots and then remove them before you run the backup again.	To remove the snapshots
		1 Run the following command to list the existing snapshots::
		`$lvs`
		The command displays the snapshot details.
		2 Run the following command to delete the snapshots:
		`$ lvremove -f <volume_group>/<snapshot_name>`

Table 5-1 Troubleshooting NetBackup for MySQL backups and restores *(continued)*

Problems	Description	Solution
The `nbmysql` backup fails with the following error: (Linux)*Error creating LVM snapshot*	The `nbmysql` backup may fail when the volume group does not have sufficient space for the snapshot.	To verify the space in the volume group **1** Run the following command to view the volume group details: `$vgs` **2** Update the `nbmysql.conf` file with the appropriate snapshot size. Verify that the snapshot is equivalent to or more than the instance size.
(Windows)*VSS snapshot creation failed*	The `nbmysql` backup may fail when the user does not have the privileges to run the `nbmysql` operations.	Run `cmd.exe` in Administrator mode.
The `nbmysql` restore operation does not restore any data from the target NetBackup client.	The `nbmysql` restore fails if the `nbmysql.conf` file is not updated with the NetBackup client name.	Add or update the NetBackup client name in the `nbmysql.conf` file. For more information, See "The nbmysql configuration file" on page 16.
The `nbmysql` restore is unsuccessful when you trigger from the target client.	The `nbmysql` restore fails if the target directory is invalid or not empty for restores. The restore may also fail, when you initiate a redirected restore from the NetBackup target client instead of the NetBackup source client.	For a successful restore ■ Verify that the target directory is a valid and empty. ■ Initiate the restore from the NetBackup source client.
Exception error during backups and restores.	The `nbmysql` restores and backups fail, if the disk space is not sufficient for the restore and backups.	Verify that the disk space is larger than the MySQL database and then initiate backups or restores. **Note:** Approximately 50% of space more than the MySQL database is required for restores and backups.

Table 5-1 Troubleshooting NetBackup for MySQL backups and restores *(continued)*

Problems	Description	Solution
Even after a successful restore, the MySQL services, failed to start.	The restore operation is successful, only when you restore the backup on a machine that has the same minor version of MySQL. For example, if you back up a file from MySQL version 5.5.x, then you must restore the file to a computer with MySQL version 5.5.x.	■ Verify that the MySQL agent and NetBackup are of same version for successful restore operations. ■ Verify that the MySQL version from the backed up data is same as the MySQL version on the computer where you want to restore the data.
The `nbmysql.conf` file is missing after installing the agent on RHEL or SUSE	Starting from NetBackup 8.2, the `nbmysql.conf` file is not created by default when you install the agent on RHEL or SUSE. The existing configuration file is prevented from getting overwritten as the RPM installer simply overwrites any existing files in the destination directory `/usr/NBMySQLAgent/.`	If the `nbmysql.conf` file does not exist, you can create the file by running the backup utility command without any options. For example, `./nbmysql`. This command creates the default `nbmysql.conf` file.

Appendix A

The NetBackup for MySQL commands and conventions

This appendix includes the following topics:

- About NetBackup for MySQL commands
- About NetBackup for MySQL conventions

About NetBackup for MySQL commands

This section describes the commands, options, and parameters that are available to run the `nbmysql` operations. Each command contains a brief description, required parameters, and the optional parameters for the respective operations. The agent supports only those commands, options, and parameters that are mentioned in this document.

Note for the following:

- You must provide the parameters for the respective operations in the `nbmysql.conf` file or provide them on the `nbmysql` command line.
- The parameter values that you provide on the command line takes precedence over the `nbmysql.conf` file.
- Set the operation type `-o` on the `nbmysql` command line.
- Set the other parameters and options for the respective operation on the `nbmysql` command line or the `nbmysql.conf` file.

  The parameters on the command line take precedence over the `nbmysql.conf` file.

The NetBackup for MySQL command options

Table A-1 lists the options for `nbmysql` command.

Table A-1 The nbmysql command options

Options	Descriptions
-C	Configures the NetBackup client name for redirected restores.
-h	Displays the Help usage, when it is the only option on the `nbmysql` command line.
-id	Configures the specified backup using the backup image name.
-l	Configures the MySQL library directory.
-o	Configures the operation type (backup, restore, query, and delete).
-P	Configures the **DataStore** policy.
-p	Configures the database server port number that identifies the MySQL instance on which the backup or restore is performed.
-s	Configures the NetBackup schedule.
-S	Configures the NetBackup master server name.
-t	Configures the target directory to restore the data.
-u	Configures the database user name.
-z	Configures the LVM snapshot size for Linux configured systems.

About NetBackup for MySQL conventions

This document uses the following conventions when describing commands that are specific to NetBackup for MySQL Agent.

Run the following commands in the command line interface to see the results:

- The `-help` command (`-h`) option prints a command-line usage message when it is the only option on the command line. For example,
  `nbmysql -h`
- Brackets [ ] indicate that the enclosed component of the command line is optional. Other parameters are required.
- Italics indicate that the information is user supplied. For example, you may provide the policy name and the schedule name for a backup operation.

```
nbmysql -o backup -S master_server_name -P policy_name -s schedule_name
```

Appendix B

The NetBackup for MySQL commands

This appendix includes the following topics:

- nbmysql -o backup
- nbmysql -o restore
- nbmysql -o query
- nbmysql -o delete

nbmysql -o backup

`nbmysql -o backup` – runs the backup from the NetBackup client.

SYNOPSIS

```
nbmysql -o backup

-S master_server_name

-P policy_name

-s schedule_name

(Linux) -l mysql_library_path

(LVM) -z snapshot_size

[-p database_server_port]

[-u  database_server_user]
```

Description

This command invokes the backup operation from the NetBackup client using the NetBackup **DataStore** policy name and the schedule type. The parameter `-S`, `-s` and `-P` are required parameters for Windows. The parameters `-l` and (LVM) `-z` are required parameters for Linux. The `-p` and `-u` are the optional parameters.

Note: In non-LVM deployments, do not set the snapshot size in the `-l` option.

On Linux systems, the directory path is `/usr/NBMySQLAgent/`

On Windows, the directory path is `install_path\NBMySQLAgent\`

Options

`-l` (Linux) Configures the MySQL library directory.

`-p` Configures the database port number that identifies the MySQL instance on which the backup is performed.

`-P` Configures the NetBackup **DataStore** policy name.

`-S` Configures the NetBackup server name.

`-s` Specifies the schedule name that you have configured for the **DataStore** policy.

`-u` Configures the database user name.

`-z` (LVM backups) Specifies the LVM snapshot size.

nbmysql -o restore

`nbmysql -o restore` – restores the backup files from the NetBackup server.

SYNOPSIS

```
nbmysql -o restore
-S master_server_name
-t target_directory
-p database_server_port
[-i copy_id]
[-C client_name]
```

Description

The `nbmysql` command restores the backup file using `-t`, `-S`, and `-p` as the required parameters. The `-i` and `-C` are optional parameters.

On Windows systems, the directory path to this command is `install_path\NBMySQLAgent\`

On Linux systems, the directory path to this command is `/usr/NBMySQLAgent/`

Options

`-C` Specifies the client name.

`-i` Specifies the backup image name.

`-p` Specifies the database server port.

`-S` Configures the NetBackup master server.

`-t` Configures the target directory to restore the backup.

nbmysql -o query

`nbmysql -o query` – query the backups.

SYNOPSIS

`nbmysql -o query`

`-S` *`master_server_name`*

`[-P` *`policy_name`*`]`

`[-C` *`client_name`*`]`

Description

The `nbmysql -o query` command gets the backup using `-S` as the required parameter and `-C` and `-P` as optional parameters

On Windows systems, the directory path to this command is `install_path\NBMySQLAgent\`

On Linux systems, the directory path to this command is `/usr/NBMySQLAgent/`

Options

`-C` Retrieves and lists all backups on the specified client name.

`-P` Retrieves and lists all backups with the specified policy name.

`-S` Configures the NetBackup master server.

nbmysql -o delete

`nbmysql -o delete` – deletes the backup information from the NetBackup catalog files.

SYNOPSIS

`nbmysql -o delete`

`-S` *`master_server_name`*

`-i` *`copy_id`*

Description

The `nbmysql-o delete` command deletes the backup images from the NetBackup catalog files, but retains the backups in the storage media.

The parameter `-S` and `-i` are the required parameters.

Options

`-i` Specifies the backup using the backup image name.

`-S` Configures the NetBackup master server.

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