

Veritas NetBackup™ for MariaDB Administrator's Guide

Windows and Linux

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VERITAS™

Veritas NetBackup™ for MariaDB Administrator's Guide

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Introduction to NetBackup for MariaDB Agent

This chapter includes the following topics:

- About NetBackup for MariaDB Agent
- Features of NetBackup for MariaDB
- The NetBackup for MariaDB Agent package
- About the NetBackup for MariaDB Agent license

About NetBackup for MariaDB Agent

NetBackup for MariaDB extends the capabilities of NetBackup to include backups and restores of the MariaDB databases. The NetBackup for MariaDB agent is located on the NetBackup client and supports the operations on standalone setups. The agent supports the MariaDB version 5.5 and later.

The agent also supports to:

- Validate the backup.
- Query a backup and restore.
- Delete the backup information from the catalog files.
- Redirect restores.

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

NetBackup for MariaDB workflow

The NetBackup for MariaDB Agent reads the parameters from the `nbmariadb.conf` file and then initiates the operations. The `nbmariadb.conf` file includes the parameters that you must set to run the respective operations.

See “The `nbmariadb.conf` configuration file” on page 17.

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

The agent then interacts with the NetBackup XBSA interface to update the server name, policy, and schedule type information. The NetBackup master 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 then sends it to the NetBackup XBSA interface. The NetBackup XBSA interface then writes this data to the mounted media or disk storage managed by the NetBackup media server.

Features of NetBackup for MariaDB

Table 1-1 lists the features that are supported by the agent.

Table 1-1 Features supported by NetBackup for MariaDB agent

| Feature | Description |
|--------------------|--|
| Backup | The agent supports full instance backups of the MariaDB database. |
| Restore | The agent supports full instance restores of MariaDB backups. |
| Redirected restore | The agent supports restoring MariaDB backups to alternate NetBackup clients. |

The NetBackup for MariaDB Agent package

The agent is packaged in `NBMariaDBAgent_8.2.zip` file and is available on my.veritas.com site.

The package file contains the following platform files:

- (Windows) `NBMariaDBAgent_8.2_AMD64/`
- (Linux RHEL) `NBMariaDBAgent_8.2_linuxR_x86/`
- (Linux SLES) `NBMariaDBAgent_8.2_linuxS_x86/`

About the NetBackup for MariaDB Agent license

The NetBackup for MariaDB Agent is installed on the NetBackup client software and is not a separately licensed option of NetBackup. The NetBackup for MariaDB 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 MariaDB Agent follows the existing capacity licensing models for supported database agents.

Installing the NetBackup for MariaDB Agent

This chapter includes the following topics:

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

Planning the installation of NetBackup for MariaDB Agent

Table 2-1 lists the planning steps that are mandatory for installing the agent.

Table 2-1 General steps for installing the agent

| Step | Action |
|--------|---|
| Step 1 | Verify the operating systems. For more information, See “Planning the installation of NetBackup for MariaDB Agent” on page 11. |

Table 2-1 General steps for installing the agent (*continued*)

| Step | Action |
|--------|---|
| Step 2 | Verify the prerequisites before you install the agent. For more information, See "Planning the installation of NetBackup for MariaDB Agent" on page 11. |
| Step 3 | Install the NetBackup for MariaDB Agent on your operating system. For more information, See "Planning the installation of NetBackup for MariaDB Agent" on page 11. |
| Step 4 | Authenticate the password for backups. For more information, See "Planning the installation of NetBackup for MariaDB Agent" on page 11. |

Verifying the operating systems and the platforms

Verify that the NetBackup for MariaDB Agent is supported on your operating system or platforms.

The agent supports the operations on following platforms:

- Red Hat Enterprise Linux (RHEL) 6.8 and later
- SUSE Enterprise Linux Server 11 SP4 and later
- Microsoft Windows Server 2012 and later
- Microsoft Windows 8.1 or later
- NetBackup 8.2 (Server and client)
- NetBackup XBSA SDK 1.1.0

Installing prerequisites for NetBackup for MariaDB Agent

Before you install, ensure that you meet the following prerequisites:

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

- The MariaDB database is installed and operational on the client.

Post-installation requirements for NetBackup for MariaDB Agent

After you install

- (Windows) Configure the NetBackup for MariaDB Agent to run with administrative privileges.
- (Windows) Add the NetBackup `bin` directory to the PATH user environment variable.
- (Linux) If the `nbmariadb.conf` file does not exist, create the default configuration file. For more information, See “The `nbmariadb.conf` configuration file” on page 17.

- (Linux) The user of the agent is a superuser or has superuser privileges.
- (Linux) Symbolic link: If a symbolic link does not exist, create a symbolic link `libmariadb.so` or `libmysqlclient.so` and ensure that it points to `libmariadb.so.<n>` and `libmysqlclient.so.<n>` respectively, where `<n>` is the MariaDB client library version. You can create the symbolic link at your chosen directory.

The client library name is `libmysqlclient.so` in older versions of MariaDB and `libmariadb.so` in newer versions.

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 `MARIADB_LIB_INSTALL_PATH` parameter in the `nbmariadb.conf` file with the absolute path of the symbolic link.

- Set the privileges for the MariaDB users for backup and restore operations. Table 2-2 lists the user type and the privileges for the respective user.

Table 2-2 User and privileges

| User type | 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 MariaDB server user privileges, run the following MariaDB 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, refer to *MariaDB Administration Guide*.

Describing the NetBackup for MariaDB Agent package

The agent is packaged in the `NBMariaDBAgent_8.2.zip` file and is available on my.veritas.com site.

The package file contains the following platform files:

- (Windows) `NBMariaDBAgent_8.2_AMD64/`
- (Linux RHEL) `NBMariaDBAgent_8.2_linuxR_x86/`
- (Linux SUSE) `NBMariaDBAgent_8.2_linuxS_x86/`

(Windows) `NBMariaDBAgent_8.2_AMD64/` includes the following files:

- `NBMariaDBAgent_8.2_AMD64/README.txt`
- `NBMariaDBAgent_8.2_AMD64/cabl.cab`
- `NBMariaDBAgent_8.2_AMD64/Setup.exe`
- `NBMariaDBAgent_8.2_AMD64/NBMariaDBAgent.msi`

(Linux RHEL) `NBMariaDBAgent_8.2_linuxR_x86/` includes the following file:

- `VRTSnbmariadbagent.rpm`

(Linux SUSE) `NBMariaDBAgent_8.2_linuxS_x86/` includes the following file:

- `VRTSnbmariadbagent.rpm`

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

The agent by default gets installed at the following locations:

- (Windows) `C:\Program Files\VERITAS\NBMariaDBAgent`
- (Linux RHEL & SUSE) `/usr/NBMariaDBAgent/`

Installing NetBackup for MariaDB Agent

To install the agent

- 1 Download the `NBMariaDBAgent_8.2.zip` file.
- 2 Extract the file that applies to your operating system:
(Windows) `NBMariaDBAgent_8.2_AMD64/`
(Linux RHEL) `NBMariaDBAgent_8.2_linuxR_x86/`
(Linux SUSE) `NBMariaDBAgent_8.2_linuxS_x86/`
- 3 Run the file that applies to your operating system
(Windows) `NBMariaDBAgent_8.2_AMD64/Setup.exe`
(Linux RHEL) `NBMariaDBAgent_8.2_linuxR_x86/VRTSnbmariadbagent.rpm`
Use the `rpm -ivh VRTSnbmariadbagent.rpm` command.
(Linux SUSE) `NBMariaDBAgent_8.2_linuxS_x86/VRTSnbmariadbagent.rpm`
Use the `rpm -ivh VRTSnbmariadbagent.rpm` command.
- 4 Type `y` to accept the VERITAS LICENSE AGREEMENT. The agent gets installed at the default location.

Note: Ensure that the MariaDB 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 (Windows) `my.ini` file and the (Linux) `my.cnf` file stores the password and the application picks the password every time you run a backup.

Authenticating the password

The agent reads the plaintext authentication credentials from the `my.cnf` file in Linux and `my.ini` file in Windows.

Prerequisites

Before you authenticate the password, you must meet the following prerequisites:

- (Windows) Set the user environment variable `MYSQL_HOME` to point to `my.ini` file path.
- (Linux) Include the `Mariadb` bin directory in `$PATH`.

To authenticate the password

- 1 (Optional) Add the client section.
- 2 Under the Client section, edit the `my.ini` or `my.cnf` file to add the password. For example,

```
[client]
```

```
port=3306
```

```
password=<password>
```

- 3 To verify the password authentication, login to MariaDB server using the following command:

```
mysql -u <user>
```

Uninstalling the NetBackup for MariaDB Agent

To uninstall the agent

- 1 (Windows) From the **Control Panel**, right-click the `Veritas NetBackup MariaDBAgent_8.2` file and **Uninstall** the agent.
- 2 (Linux RHEL or SUSE) To uninstall, run the following command:

```
rpm -e VRTSnbmariadbagent
```


Configuring the NetBackup for MariaDB

This chapter includes the following topics:

- The `nbmariadb.conf` configuration file
- Configuring the MariaDB backups with DataStore policies

The `nbmariadb.conf` configuration file

The NetBackup for MariaDB (`nbmariadb.conf`) configuration file contains the parameters for the respective operations. It contains predefined settings and is located on the client. You can configure the parameters in the `nbmariadb.conf` file or provide them on the command line, where the command line parameters take precedence.

The `nbmariadb.conf` file keeps you from providing the parameters every time you run operations. When parameters are not configured in the `nbmariadb.conf` file, then the default parameter value takes precedence.

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

- (Windows)
`C:\Program Files\Veritas\NBMariaDBAgent\nbmariadb.conf`
- (Linux RHEL and SUSE) `/usr/NBMariaDBAgent\nbmariadb.conf`

Creating the `nbmariadb` configuration file

Starting from NetBackup 8.2, the `nbmariadb.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/NBMariaDBAgent/`.

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

Table 3-1 lists the `nbmariadb.conf` file parameters:

Table 3-1 The `nbmariadb.conf` file parameters

| Parameters | Description | Required parameter for | Default value |
|---------------------------------|---|---------------------------------------|--|
| DB_PORT | Configures the MariaDB database server port number on which the backup or the restore should be performed. The port number verifies the MariaDB service status. | Backups and restores | When you do not specify the port number, the default is 3306. |
| DB_USER | Configures the MariaDB database user name. | Backups | When you do not specify the username, the default is root . |
| MARIADB_LIB_INSTALL_PATH | (Linux) Configures the <code>libmariadb.so</code> binary path. | Backups | No default value. |
| MASTER_SERVER_NAME | Specifies the NetBackup master server to run backups, restores query and delete the backups and restores. | Backups, restores, query, and delete. | No default value. |
| POLICY_NAME | Specifies the DataStore policy name. | Backups | No default value. |
| SCHEDULE_NAME | Identifies the backup schedule that you configured while creating the DataStore policy. | Backups | No default value. |
| CLIENT_NAME | Defines the NetBackup MariaDB client name. | Redirected restores and query | When you do not specify the client name, the default is NetBackup master server. |
| SNAPSHOT_SIZE | (Linux) Specifies the snapshot size for LVM snapshots. Specify the snapshot size in kilobytes, megabytes, or gigabytes as KB, MB, or GB respectively. | LVM backups | When you do not specify the snapshot size, the default is <code>MB</code> . |

Table 3-1 The nbmariadb.conf file parameters (continued)

| Parameters | Description | Required parameter for | Default value |
|---------------------------------|---|--|---|
| DB_BACKUP_ID | DB_BACKUP_ID is the backup image name. This parameter configures the backup file that you specify using the backup id. | To delete a backup by specifying its backup image name. | No default value. |
| MARIADB_TARGET_DIRECTORY | Specifies the destination directory where you want to restore the backups. | Restores | No default value. |
| NBMARIADB_LOG_LEVEL | <p>The NBMARIADB_LOG_LEVEL parameter lets you set the logging level for the <code>nbmariadb</code> logs. For a particular logging level, all details at that level or lower are logged.</p> <p>The <code>nbmariadb</code> debug logs includes the following verbose levels:</p> <ul style="list-style-type: none"> ■ 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 for troubleshooting errors. | When you do not specify the <code>nbmariadb</code> log level, the default is log level 1. |
| NBMARIADB_LOG_SIZE | Specifies the <code>nbmariadb</code> log size in MB. The default size is 10MB. When the log reaches the specified size, it overwrites the existing 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 <code>nbmariadb</code> log size, the default is 10MB. |

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

| Parameters | Description | Required parameter for | Default value |
|--------------------|--|------------------------|---------------|
| BACKUP_TYPE | <p>Available options:</p> <ul style="list-style-type: none"> ■ auto: Default option. Performs an auto discovery backup. ■ lvm: Agent forces to do a lvm snapshot. ■ nonlvm: Agent forces to do nonlvm way backup, using mariabackup. | Backup operations | auto |

Configuring the MariaDB backups with DataStore policies

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

To configure the MariaDB 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 **DataStore Policy** from **Policy Type** drop-down list.
- 6 From the **Policy Storage** drop-down list, select a **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** Under the **Clients** tab, click **New** and then add the NetBackup client that has the **NetBackup for MariaDB 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 settings in `nbmariadb.conf` file, before you run the backup.
- 12** For more information, See “The nbmariadb.conf configuration file” on page 17.

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

NetBackup for MariaDB backup and restore

This chapter includes the following topics:

- About MariaDB backups
- Performing MariaDB backups
- Validating the backup information
- Querying the backups
- Deleting backup information from the NetBackup catalog files
- About restoring MariaDB backups
- Performing the restores for MariaDB databases
- Redirected restores
- Disaster recovery

About MariaDB backups

The `nbmariadb -o backup` command initiates the backup operation using the `-s`, `-P`, `-s` and `-l` as required parameters. The parameter `-z` is the required parameter for Linux operating systems.

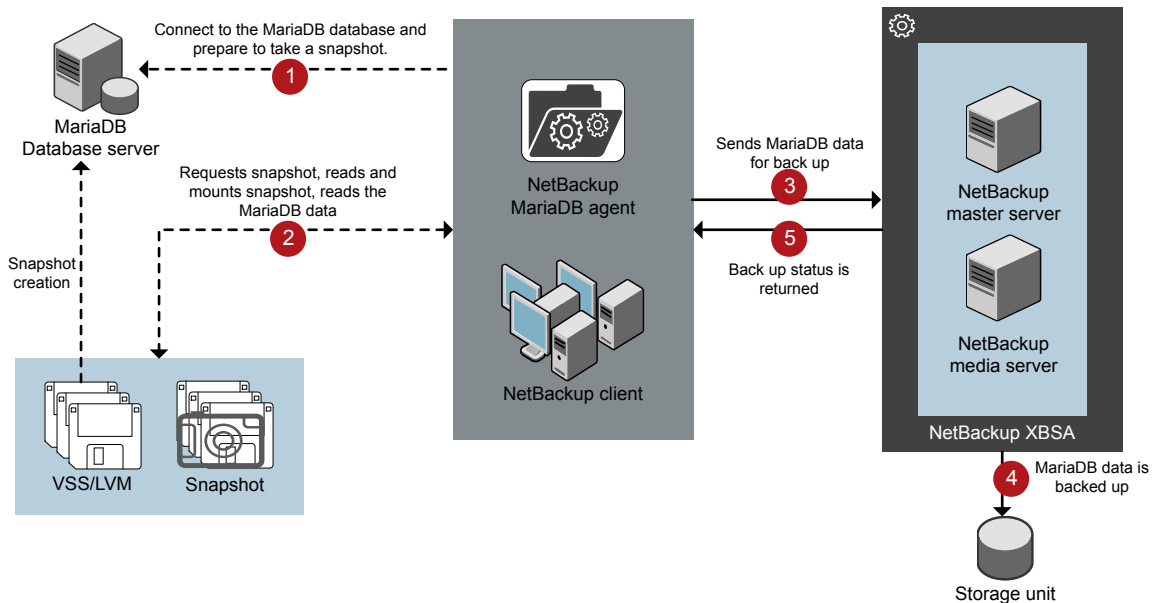
The parameter `portnum` is the optional parameter. Configure these parameters in the `nbmariadb.conf` file or provide them on the `nbmariadb` command line, where the parameters provided on the command line takes precedence.

The agent protects the following files:

- Schema files that are associated with all database tables.
- Files that are associated with the database tables.
- Data and index files.

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

Figure 4-1 NetBackup for MariaDB backup workflow



The NetBackup for MariaDB workflow

When you initiate a backup, the agent connects to the MariaDB database to execute a flush and read only lock on all tables. The agent then reads the associated NetBackup for MariaDB Agent database files from the mounted directory and initiates the backup. The LVM or VSS, then creates a snapshot, and mounts the snapshot.

The agent copies the associated files (the whole instance or the individual database) and then sends to the NetBackup XBSA interface. The NetBackup XBSA interface writes this data to the mounted media or disk storage managed by the NetBackup media server.

The command prompt displays the successful completion status of the backup. The **Activity Monitor** also displays the status for the backup job.

Performing MariaDB backups

Prerequisites

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

- Ensure that versions of the MariaDB agent and NetBackup are same. If you upgrade NetBackup to newer version, then you must upgrade the agent version also.
- (LVM users) Ensure that the MariaDB data directory and logs directory reside on the logical volume.
- (Windows) Set the `NetBackup\bin` directory in the environment variable.
For example, `Path =C:\Program Files\Veritas\Netbackup\bin`
- (Windows) Set the `MariaDB\bin` directory in user environment variable.
- Configure the **DataStore** policy from the **NetBackup Administration Console**.
- (LVM) Verify that there is enough space for the snapshot in the volume group, and then set the snapshot size in `nbmariadb.conf` file or by the command line.

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

- (Linux) Create a symbolic link `libmariadb.so` and ensure that it points to the correct `libmariadb.so.<n>` library version.
Ensure that you update the `MARIADB_LIB_INSTALL_PATH` parameter in the `nbmariadb.conf` file with the absolute path of the symbolic link.
For more information, See “Post-installation requirements for NetBackup for MariaDB Agent” on page 13.
- Set the `FLUSH` and `LOCK` user privileges.
- Set the following parameters in the `nbmariadb.conf` file:
 - `DB_USER`

- DB_PORT
 - MASTER_SERVER_NAME
 - POLICY_NAME
 - SCHEDULE_NAME
 - MARIADB_LIB_INSTALL_PATH
 - (Linux) SNAPSHOT_SIZE
- Verify the installing prerequisites and post-installation requirements.
For more information, See “Installing prerequisites for NetBackup for MariaDB Agent” on page 12.
For more information, See “Post-installation requirements for NetBackup for MariaDB Agent” on page 13.

To run the backup

- 1 Run the following command:

```
nbmariadb -o backup  
  
-S master_server_name  
  
-P policy_name  
  
-s schedule_name  
  
(Linux)-z snapshot_size  
  
-l mariadb_library_path  
  
[-portnum db_port]  
  
[-u db_user]  
  
(Linux)-b backup_type
```

- 2 (Optional) When prompted, type the database password. The NetBackup then connects to the database and initiates the backup.

Scheduling MariaDB backups from the NetBackup

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

For more information, https://www.veritas.com/support/en_US/article.100041621

Validating the backup information

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

```
nbmariadb -o query
```

Querying the backups

The `nbmariadb query` command lists the backup files according to the options that you specify. You can configure these parameters from the `nbmariadb.conf` file or provide the parameters using the `nbmariadb` command line. The parameter `-S` is the required parameter. Alternatively, you can query the backups using the `-C` and `-P` options to define a different client and policy.

By default, NetBackup uses the values that you have configured in the `nbmariadb.conf` file.

Before you run a query, you must set the following parameters in the `nbmariadb.conf` file or provide on the command line:

- `CLIENT_NAME`
- `POLICY_NAME`
- `MASTER_SERVER_NAME`

To query backup

- 1 Configure the settings in the `nbmariadb.conf` file or the `nbmariadb` command line.
- 2 Run the following command:

```
nbmariadb -o query -S master_server_name [-C client_name] [-P  
policy_name]
```

For example, to query a backup from Client A, run the following command:

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

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

```
nbmariadb -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:

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

Deleting backup information from the NetBackup catalog files

The `nbmariadb` command for `delete`, removes the backup information from the catalog files but retains the backup files on the NetBackup media server. The parameter `-s` and `-id` are required parameters.

Before you delete the backups, you must set the following parameter in the `nbmariadb.conf` file or provide them on the command line:

- `DB_BACKUP_ID`
- `MASTER_SERVER_NAME`

To delete a backup

- 1 Configure the parameters, in the `nbmariadb.conf` file or the `nbmariadb` command line.
- 2 Run the following command:

```
nbmariadb -o delete -S master_server_name -id db_backup_image_name.
```

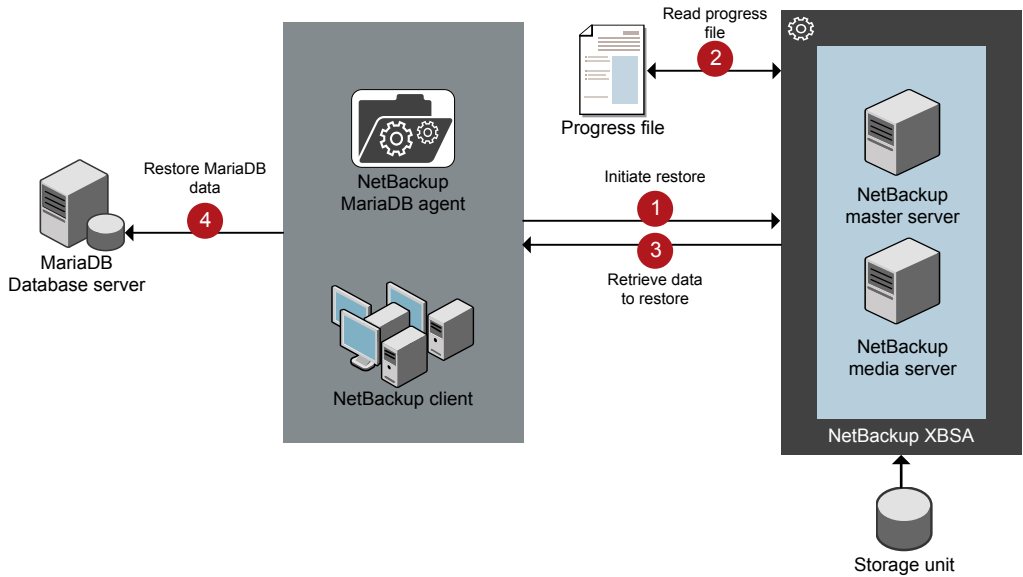
About restoring MariaDB backups

The `nbmariadb -o restore` command for `restore` initiates the restore operation using `-s`, `-t`, and `portnum` as the required parameters. The parameters `-id` and `-c` are optional parameters.

The parameter `-id` restores the backup using the specified backup image name. The parameter `-c` lists all the backups that exist on the specified client. When you do not specify the client, it defaults to NetBackup master server.

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

Figure 4-2 NetBackup for MariaDB restore workflow



The NetBackup for MariaDB restore workflow

When you initiate a restore, the agent reads the command line arguments and parses the `nbmariadb.conf` configuration file. The agent then interacts with the NetBackup XBSA interface to retrieve the backup according to the specified parameters.

The NetBackup XBSA interface reads the progress files to receive the MariaDB backup files to restore them to the target directory.

The command prompt indicates the successful completion status of the restore. The **Activity Monitor** also displays the status for the restore job.

Prerequisites

Before you run a restore, you must meet the following prerequisites:

- Ensure that versions of the MariaDB agent and NetBackup are same. If you upgrade NetBackup to newer version, then you must upgrade the agent version also.

- (LVM users) Ensure that data logs and the logs directory reside on the logical volume
- Ensure that you restore the MariaDB instance to a valid empty target directory.
- (non-LVM) Ensure that the MariaDB service is running.
- Set the following parameters in the `nbmariadb.conf` file:
 - `CLIENT_NAME`
 - `DB_BACKUP_ID`
 - (Linux) `DB_PORT`
 - `MARIADB_TARGET_DIRECTORY`
 - `MASTER_SERVER_NAME`

Performing the restores for MariaDB databases

To restore backup

- 1 Configure the parameters in the `nbmariadb.conf` file, or the `nbmariadb` command line.

- 2 Run the following command:

```
nbmariadb -o restore -S master_server_name -t target_directory  
portnum db_port [-id db_backup_image_name] [-C client_name]
```

- 3 Restart the MariaDB services.

Redirected restores

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 MariaDB 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 `nbmariadb.conf` file with the NetBackup client name as the host and the MariaDB 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/opensv/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:

```
nbmariadb -o restore -S master_server_name -t target_directory  
-portnum db_port [-id db_backup_image_name] [-C client_name]
```

- 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:

```
nbmariadb -o restore -S master_server_name -t target_directory  
-portnum db_port [-id db_backup_image_name] [-C client_name]
```

- 2 After a successful restore, change the ownership of data directory to MariaDB user.
- 3 Copy the restore data to the data directory.

Disaster recovery

Disaster recovery is the plan to recover the data that may get lost in a disaster event. The agent supports redirected restore as a disaster recovery strategy.

For more information, See “Redirected restores” on page 30.

Troubleshooting for NetBackup for MariaDB

This chapter includes the following topics:

- Troubleshooting errors when using NetBackup for MariaDB

Troubleshooting errors when using NetBackup for MariaDB

General guidelines to resolve problems

Table 5-1 lists the general steps that help you resolve problems you may encounter while using NetBackup for MariaDB Agent.

Table 5-1 General steps to resolve problems

| Steps | Action | Description |
|-------|----------------------------|--|
| Step1 | Remember the error message | Error messages are usually the vehicles for telling you something went wrong. If you do not see an error on the command line, but still suspect a problem, check the logs and the reports. These can provide an error message that directly points to the problem. The logs and reports are essential troubleshooting tools. |

Table 5-1 General steps to resolve problems (*continued*)

| Steps | Action | Description |
|--------|---|---|
| Step 2 | Identify what you were doing when the problem occurred. | <p>Ask the following questions:</p> <ul style="list-style-type: none"> ■ What operation was tried? ■ What method did you use? ■ What type of server platform and operating system was involved? ■ If your site uses both master server and media server, was it a master server or a media server? ■ If a client was involved, what type of client was it? ■ Have you performed the operation successfully in the past? If so, what is different now? ■ What is the service pack level? ■ Do you use operating system software with the latest fixes supplied, especially those required for use with NetBackup? ■ Is your device firmware at a level, or higher than the level, at which it has been tested according to the posted device compatibility lists? |
| Step 3 | Record all information. | <p>Capture potentially valuable information:</p> <ul style="list-style-type: none"> ■ The NetBackup logs. ■ The logs specific to NetBackup for MariaDB logs. ■ The logs specific to NetBackup XBSA . |
| Step 4 | Correct the problem. | After you define the problem, use the information to correct it. |
| Step 5 | Contact Technical Support | If you cannot solve the troubleshooting, contact the Technical support. |

Troubleshooting errors using logs

To troubleshoot the errors, you can refer to the NetBackup logs, NetBackup for MariaDB Agent logs, and the NetBackup XBSA logs. These 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`

You must enable the `bprd` and the `bpcd` log files. For more information, see the *NetBackup Troubleshooting Guide*

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

- `install_path\nbmariadb.log`

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

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

Troubleshooting NetBackup errors

For troubleshooting NetBackup errors, see *Veritas NetBackup Troubleshooting Guide* and the *Veritas NetBackup Commands Reference Guide*

Troubleshooting NetBackup for MariaDB Agent errors

Table 5-2 lists the errors and the solutions to troubleshoot the problems while running the operations.

Table 5-2 Troubleshooting NetBackup for MariaDB errors

| Problems | Description | Solution |
|---|--|---|
| The <code>nbmariadb</code> backup fails with the following error: <i>Unable to load mariadb library</i> | You may encounter this problem when the <code>nbmariadb.conf</code> file is not updated with the following: <ul style="list-style-type: none"> ■ <code>MARIADB_LIB_INSTALL_PATH</code> ■ <code>MARIADB_LIB_INSTALL_PATH</code> does not point to <code>libmariadb.so.<n></code> library version. | Verify the following and then run the backup again: <ul style="list-style-type: none"> ■ Add or update the MariaDB library file location in the <code>nbmariadb.conf</code> file. ■ Ensure that the <code>MARIADB_LIB_INSTALL_PATH</code> is set to the correct path. It should point to <code>libmariadb</code> library version. ■ (Linux) Create a symbolic link <code>libmariadb.so</code> that points to the <code>libmariadb.so.<n></code> library version. |
| The <code>nbmariadb</code> backup fails with the following error: <i>Unable to connect to the database</i> | The <code>nbmariadb</code> backup fails when the <code>nbmariadb.conf</code> file is updated with invalid username or port number. | To add the appropriate database user name and port number <ul style="list-style-type: none"> ■ Configure the appropriate database user name and port number in the <code>nbmariadb.conf</code> file or provide the parameters from the <code>nbmariadb</code> command line. For more information, See “The <code>nbmariadb.conf</code> configuration file” on page 17. |

Table 5-2 Troubleshooting NetBackup for MariaDB errors (*continued*)

| Problems | Description | Solution |
|---|--|---|
| The <code>nbmariadb</code> backup fails with the following error: <i>Unable to load xbsa.dll</i> | The <code>nbmariadb</code> backup fails if the environment variable path is not updated with NetBackup bin directory. | To run a <code>nbmariadb</code> backup <ul style="list-style-type: none"> Update the environment variable path with <code>NetBackup_install_path/bin</code>. |
| The <code>nbmariadb</code> backup fails with the following error: <i>XBSA initiation failed</i> | The <code>nbmariadb</code> backup fails if the <code>nbmariadb.conf</code> file is not updated with the required parameters. | To run the <code>nbmariadb</code> backup <ul style="list-style-type: none"> Configure the valid master server name, policy name, schedule type in the <code>nbmariadb.conf</code> file or from the command line. Verify if there are communication errors between the <code>nbmariadb</code> agent and the NetBackup master server. For more information see the <i>NetBackup Administration guide</i>. |
| (Windows) <i>VSS snapshot creation failed</i> | The <code>nbmariadb</code> backup may fail when the user does not have the privileges to run the <code>nbmariadb</code> operations. | Run <code>cmd.exe</code> in Administrator mode. |
| The <code>nbmariadb</code> restore operation does not restore any data from the target NetBackup client. | The <code>nbmariadb</code> restore fails if the <code>nbmariadb.conf</code> file is not updated with the NetBackup client name and the target directory. | For a successful restore <ul style="list-style-type: none"> Verify that the target directory is valid and empty. Initiate the restore from the NetBackup source client. Set the NetBackup client name and target directory parameters in the <code>nbmariadb.conf</code> file. |
| The <code>nbmariadb</code> backup fails with the following error: (Linux) <i>Error creating LVM snapshot</i> | The <code>nbmariadb</code> backup may fail when the volume group does not have sufficient space for the snapshot. To verify the space in the volume group | To verify the space in the volume group <ol style="list-style-type: none"> To view the space in the volume, run the following command: <code>\$vgs</code> The command displays the volume group details. Update the <code>nbmariadb.conf</code> file with the appropriate snapshot size. The snapshot should be equivalent to or more than the instance size. |

Table 5-2 Troubleshooting NetBackup for MariaDB errors (*continued*)

| Problems | Description | Solution |
|---|---|--|
| <p>Error messages after a successful backup:</p> <pre><volume_group>/<snapshot_name> Read failure after 0 of 4096 at 29393616896: input or output error. <p>OR</p> <pre><volume_group>/<snapshot_name>: read failure after 0 of 4096 at 4096: input or output error.</pre> </pre> | <p>The <code>nbmariadb</code> 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.</p> <p>Note: The <code>nbmariadb</code> created LVM snapshot names are prefixed with <code>mariadbsnap</code></p> | <p>To remove the snapshots</p> <ol style="list-style-type: none"> 1 To list the existing snapshot, run the following command: <pre>\$lvs</pre> <p>The command displays the snapshot details.</p> 2 To remove the snapshots, run the following command: <pre>\$ lvremove -f <volume_group>/<snapshot_name></pre> |
| <p>The <code>nbmariadb</code> backup fails with the following error:</p> <p><i>"Failed to load MariaDB Library"</i></p> | <p>You may encounter this problem when the <code>nbmariadb.conf</code> file is not updated with the following:</p> <ul style="list-style-type: none"> ■ MariaDB library file location. ■ The <code>MARIADB_LIB_INSTALL_PATH</code> does not point to <code>libmariadb.so.<n></code> | <p>Verify the following and then run the backup again:</p> <ul style="list-style-type: none"> ■ Add or update the MariaDB library file location in the <code>nbmariadb.conf</code> file. For more information, See "The <code>nbmariadb.conf</code> configuration file" on page 17. ■ Ensure that the <code>MARIADB_LIB_INSTALL_PATH</code> is set to the absolute path of the symbolic link. ■ (Linux) Create a symbolic link <code>libmariadb.so</code> and ensure that it points to the correct <code>libmariadb.so.<n></code> library version. For more information, See "Post-installation requirements for NetBackup for MariaDB Agent" on page 13. |

Table 5-2 Troubleshooting NetBackup for MariaDB errors (*continued*)

| Problems | Description | Solution |
|--|--|---|
| <p>The <code>nbmariadb</code> backup on Linux (LVM), fails with the following error:</p> <p><i>Error unmounting the snapshot-Device or resource busy</i></p> <p>OR</p> <p><i>Error removing the snapshot-mariadbsnap_<timestamp></i></p> | <p>The <code>nbmariadb</code> backup fails during an attempt to unmount the snapshot, the device, or when you remove the existing snapshots.</p> | <p>To unmount the snapshot</p> <ol style="list-style-type: none"> 1 To list all mounted file systems run the following command: <pre>\$ mount-l</pre> 2 If the snapshot still exists, create a mount directory using the following command: <pre>\$mount<mount_directory></pre> <p>Note: This directory is created in <code>/mnt/<snapshot_name></code>. The prefix names for snapshot are <code>pgsqlsnap</code>.</p> 3 To remove the mount directory run the following command: <pre>\$rm -rf <mount_directory></pre> 4 To remove the snapshot manually run the following command: <pre>lvremove -f <volume_group>/<snapshot_name></pre> |
| <p>Even after a successful restore, the MariaDB services failed to start.</p> | <p>The restore operation is successful, only when you restore the backup on a machine that has the same minor version of MariaDB.</p> <p>For example, if you back up a file from MariaDB version 10.2.x, then you must restore the file to a computer with MariaDB version 10.2.x.</p> | <ul style="list-style-type: none"> ■ Verify that the MariaDB agent and NetBackup are of same version for successful restore operations. ■ Verify that the MariaDB version from the backed up data is same as the MariaDB version on the computer where you want to restore the data. |

Table 5-2 Troubleshooting NetBackup for MariaDB errors (*continued*)

| Problems | Description | Solution |
|---|--|---|
| <p>The <code>nbmariadb.conf</code> file is missing after installing the agent on RHEL or SUSE</p> | <p>Starting from NetBackup 8.2, the <code>nbmariadb.conf</code> 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 <code>/usr/NBMariaDBAgent/.</code></p> | <p>If the <code>nbmariadb.conf</code> file does not exist, you can create the file by running the backup utility command without any options. For example, run the <code>./nbmariadb</code> command. This command creates the default <code>nbmariadb.conf</code> file.</p> |

About NetBackup for MariaDB commands and conventions

This appendix includes the following topics:

- About NetBackup for MariaDB commands
- About NetBackup for MariaDB command conventions

About NetBackup for MariaDB commands

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

Observe for the following:

- You must provide the parameters in the `nbmariadb.conf` file or on the `nbmariadb` command line.
- The parameters that you provide on the command line takes precedence over the `nbmariadb.conf` file.
- Specify the operation type `-o` on the `nbmariadb` command line.
- Specify the parameters and options for the respective operations on the `nbmariadb` command line or in the `nbmariadb.conf` file.

The NetBackup for MariaDB command options

Table A-1 The nbmariadb command options

| Options | Description |
|----------|--|
| -C | Configures the NetBackup client name for redirected restores. |
| -h | Displays the Help usage, when it is the only option on the <code>nbmariadb</code> command line. |
| -id | Configures the specified backup using the backup image name. |
| -l | Configures the MariaDB library path. |
| -o | Configures the operation type (backup, restore, query, and delete). |
| -P | Configures the DataStore policy. |
| -portnum | Configures the database server port number that identifies the MariaDB instance on which the backup or restore is performed. |
| -s | Configures the NetBackup schedule. |
| -S | Configures the NetBackup master server. |
| -t | Configures the target directory to restore the data. |
| -u | Configures the database user name. |
| -z | Configures the LVM snapshot size. |
| -b | Configures the backup type as LVM or non-LVM. |

About NetBackup for MariaDB command conventions

This document uses the following conventions when describing commands that are specific when running the operations for MariaDB database.

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,

```
nbmariadb -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.

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


NetBackup for MariaDB commands

This appendix includes the following topics:

- `nbmariadb -o backup`
- `nbmariadb -o restore`
- `nbmariadb -o query`
- `nbmariadb -o delete`

nbmariadb -o backup

`nbmariadb -o backup` – runs the backup operation from the NetBackup client.

SYNOPSIS

```
nbmariadb -o backup
-S master_server_name
-P policy_name
-s schedule_name
(Linux) -l mariadb_library_path
[(Linux) -b backup_type auto, lvm, and nonlvm]
(LVM) -z snapshot_size
[-portnum db_port]
[-u db_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` and `-P` are required parameters for Windows. The parameters `-l` and (LVM) `-z` are required parameters for Linux. The `-portnum`, `-b`, and `-u` are the optional parameters.

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

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

Options

- `-l`
(Linux) Configures the MariaDB library directory
- `-portnum`
Configures the database port number that identifies the MariaDB 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.
- b Configures the backup type as LVM or non-LVM.

nbmariadb -o restore

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

SYNOPSIS

```
nbmariadb -o restore -S master_server_name -t target_directory  
-portnum db_port[-id db_backup_image_name] [-C client_name]
```

Description

The `nbmariadb` command restores the backup file using `-t`, `-s`, and (non-LVM) `portnum` as the required parameters. The `-id` and `-C` are optional parameters.

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

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

Options

- `-C`
Specifies the client name.
- `-id`
Specifies the backup image name.
- `-portnum`
Specifies the database server port.
- `-S`
Configures the NetBackup master server.
- `-t`
Configures the target directory where the backups are restored.

nbmariadb -o query

`nbmariadb -o query` – query the backup.

SYNOPSIS

```
nbmariadb -o query -S master_server_name [-C client_name] [-P  
policy_name]
```

Description

The `nbmariadb -o query` command gets the backup using `-s` as the required parameter and `-C` and `-P` as optional parameters.

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

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

Options

- `-C` Retrieves and lists all the backups of the specified client.
- `-P` Retrieves and lists all backups with the specified policy name.
- `-S` Configures the NetBackup master server.

nbmariadb -o delete

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

SYNOPSIS

```
nbmariadb -o delete -S master_server_name -id db_backup_image_name
```

Description

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

The parameter `-s` and `-id` are the required parameters.

Options

- `-id`
Specifies the backup using the backup image name.
- `-s`
Configures the NetBackup master server.

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