Veritas NetBackup™ for MariaDB Administrator's Guide

Windows and Linux

Release 8.1.1
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- Version and patch level
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- Router, gateway, and IP address information
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  - Error messages and log files
  - Troubleshooting that was performed before contacting Technical Support
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- Advice about technical support options
- Nontechnical presales questions
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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
- NetBackup for MariaDB documentation

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.
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.

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 NetBackup for MariaDB agent.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backup</td>
<td>The agent supports full instance backups of the MariaDB database.</td>
</tr>
<tr>
<td>Restore</td>
<td>The agent supports full instance restores of MariaDB backups.</td>
</tr>
<tr>
<td>Redirected restore</td>
<td>The agent supports restoring MariaDB backups to alternate NetBackup clients.</td>
</tr>
</tbody>
</table>

The NetBackup for MariaDB Agent package

The agent is packaged in `NBMariaDBAgent_8.1.zip` file and is available on `my.veritas.com` site.

The package file contains the following platform files:

- (Windows) `NBMariaDBAgent_8.1_AMD64/`
- (Linux RHEL) `NBMariaDBAgent_8.1_linuxR_x86/`
- (Linux SLES) `NBMariaDBAgent_8.1_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.

NetBackup for MariaDB documentation

The NetBackup for MariaDB documentation is available at the following URL:

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>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>Verify the operating systems.</td>
</tr>
<tr>
<td></td>
<td>For more information, See &quot;Verifying the operating systems and the</td>
</tr>
<tr>
<td></td>
<td>platforms&quot; on page 13.</td>
</tr>
</tbody>
</table>
### General steps for installing the agent (continued)

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 2</td>
<td>Verify the prerequisites before you install the NetBackup for MariaDB Agent. For more information, See “Installing prerequisites for NetBackup for MariaDB Agent” on page 13.</td>
</tr>
<tr>
<td>Step 3</td>
<td>Install the NetBackup for MariaDB Agent on your operating system. For more information, See “Installing NetBackup for MariaDB Agent” on page 16.</td>
</tr>
<tr>
<td>Step 4</td>
<td>Authenticate the password for backups. For more information, See “Authenticating the password” on page 16.</td>
</tr>
</tbody>
</table>

### 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 2008 R2 and later
- Microsoft Windows 8.1 and later
- NetBackup 8.1 (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 8.1 is installed and operational on the master server, media server, and the client.
- 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) The user of the agent is a superuser or has superuser privileges.
- (Linux) Symbolic link: If a symbolic link does not exists, 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>
<thead>
<tr>
<th>Table 2-2</th>
<th>User and privileges</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>User type</strong></td>
<td><strong>Privileges</strong></td>
</tr>
<tr>
<td>Backup</td>
<td>LOCK TABLES, SELECT FILE, RELOAD, SUPER, UPDATE, TRIGGER, SHOW, VIEW, EXECUTE, and EVENT.</td>
</tr>
<tr>
<td>Restore</td>
<td>CREATE, DROP, INDEX, SHUTDOWN, INSERT, ALTER, DELETE, UPDATE, TRIGGER, SUPER, and CREATE VIEW.</td>
</tr>
</tbody>
</table>

To set the MariaDB server user privileges, run the following MariaDB commands:

```sql
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';
```
Describing the NetBackup for MariaDB Agent package

The agent is packaged in the `NBMariaDBAgent_8.1.zip` file and is available on my.veritas.com site.

The package file contains the following platform files:

- (Windows) `NBMariaDBAgent_8.1_AMD64/`
- (Linux RHEL) `NBMariaDBAgent_8.1_linuxR_x86/`
- (Linux SUSE) `NBMariaDBAgent_8.1_linuxS_x86/`

(Windows) `NBMariaDBAgent_8.1_AMD64/` includes the following files:

- `NBMariaDBAgent_8.1_AMD64/README.txt`
- `NBMariaDBAgent_8.1_AMD64/cab1.cab`
- `NBMariaDBAgent_8.1_AMD64/Setup.exe`
- `NBMariaDBAgent_8.1_AMD64/NBMariaDBAgent.msi`

(Linear RHEL) `NBMariaDBAgent_8.1_linuxR_x86/` includes the following files:

- `NBMariaDBAgent_8.1_linuxR_x86/README`
- `NBMariaDBAgent_8.1_linuxR_x86/install`
- `NBMariaDBAgent_8.1_linuxR_x86/LICENSE`
- `NBMariaDBAgent_8.1_linuxR_x86/pkg.tar`

(Linear SUSE) `NBMariaDBAgent_8.1_linuxS_x86/` includes the following files:

- `NBMariaDBAgent_8.1_linuxS_x86/README`
- `NBMariaDBAgent_8.1_linuxS_x86/install`
- `NBMariaDBAgent_8.1_linuxS_x86/LICENSE`
- `NBMariaDBAgent_8.1_linuxS_x86/pkg.tar`

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_8.1.zip file.

2. Extract the file that applies to your operating system:
   - (Windows) NBMariaDBAgent_8.1_AMD64/
   - (Linux RHEL) NBMariaDBAgent_8.1_linuxR_x86/
   - (Linux SUSE) NBMariaDBAgent_8.1_linuxS_x86/

3. Run the file that applies to your operating system
   - (Windows) NBMariaDBAgent_8.1_AMD64/Setup.exe
   - (Linux RHEL) NBMariaDBAgent_8.1_linuxR_x86/install
   - (Linux SUSE) NBMariaDBAgent_8.1_linuxS_x86/install

4. Type y to accept the VERITAS LICENSE AGREEMENT. The agent gets installed at the default location.

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 MySQL 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_8.1` file and Uninstall the agent.

2  (Linux RHEL and SUSE) To uninstall, delete the `/usr/NBMariaDBAgent` directory from the installed location.
Configuring the NetBackup for MariaDB

This chapter includes the following topics:

- The nbmariadb.conf configuration file
- Configuring NetBackup for 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

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

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
<th>Required parameter for</th>
<th>Default value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_PORT</td>
<td>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.</td>
<td>Backups and restores</td>
<td>When you do not specify the port number, the default is 3306.</td>
</tr>
<tr>
<td>DB_USER</td>
<td>Configures the MariaDB database user name.</td>
<td>Backups</td>
<td>When you do not specify the username, the default is <code>root</code>.</td>
</tr>
<tr>
<td>MARIADB_LIB_INSTALL_PATH</td>
<td>(Linux) Configures the <code>libmariadb.so</code> binary path.</td>
<td>Backups</td>
<td>No default value.</td>
</tr>
<tr>
<td>MASTER_SERVER_NAME</td>
<td>Specifies the NetBackup master server to run backups, restores query and delete the backups and restores.</td>
<td>Backups, restores, query, and delete.</td>
<td>No default value.</td>
</tr>
<tr>
<td>POLICY_NAME</td>
<td>Specifies the DataStore policy name.</td>
<td>Backups</td>
<td>No default value.</td>
</tr>
<tr>
<td>SCHEDULE_NAME</td>
<td>Identifies the backup schedule that you configured while creating the DataStore policy.</td>
<td>Backups</td>
<td>No default value.</td>
</tr>
<tr>
<td>CLIENT_NAME</td>
<td>Defines the NetBackup MariaDB client name.</td>
<td>Redirected restores and query</td>
<td>When you do not specify the client name, the default is NetBackup master server.</td>
</tr>
<tr>
<td>SNAPSHOT_SIZE</td>
<td>(Linux) Specifies the snapshot size for LVM snapshots. Specify the snapshot size in kilobytes, megabytes, or gigabytes as KB, MB, or GB respectively.</td>
<td>LVM backups</td>
<td>When you do not specify the snapshot size, the default is MB.</td>
</tr>
<tr>
<td>DB_BACKUP_ID</td>
<td><code>DB_BACKUP_ID</code> is the backup image name. This parameter configures the backup file that you specify using the backup id.</td>
<td>To delete a backup by specifying its backup image name.</td>
<td>No default value.</td>
</tr>
<tr>
<td>MARIADB_TARGET_DIRECTORY</td>
<td>Specifies the destination directory where you want to restore the backups.</td>
<td>Restores</td>
<td>No default value.</td>
</tr>
</tbody>
</table>
### Table 3-1
The nbmariadb.conf file parameters (continued)

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
<th>Required parameter for</th>
<th>Default value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NBMARIADB_LOG_LEVEL</strong></td>
<td>The NBMARIADB_LOG_LEVEL parameter lets you set the logging level for the nbmariadb logs. For a particular logging level, all details at that level or lower are logged. The nbmariadb debug logs includes the following verbose levels:</td>
<td>The log levels help to control the amount of information that you want to access for troubleshooting errors.</td>
<td>When you do not specify the nbmariadb log level, the default is log level 1.</td>
</tr>
<tr>
<td>1 – ERROR: Conditions that should be corrected, such as configuration errors.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 – WARN: Conditions that are not errors, but that might require special handling.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 – INFO: Informational messages</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 – DEBUG: Debugging the messages that is used for troubleshooting.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>NBMARIADB_LOG_SIZE</strong></td>
<td>Specifies the nbmariadb log size in MB. The default size is 10MB. When the log reaches the specified size, it overwrites the existing log information.</td>
<td>You can specify the value according to the events that you want to write into the logs.</td>
<td>When you do not specify the nbmariadb log size, the default is 10MB.</td>
</tr>
</tbody>
</table>

### Configuring NetBackup for 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 **Default-Application-Backup** schedule type.

   **Note:** The XBSA framework supports the **Default-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 18.
The NetBackup for MariaDB backups and restores

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.

**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 MariaDB 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:

- (LVM users) Ensure that the MariaDB data directory and logs directory reside on logical volumes.
- (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` 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 14.

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 13.

For more information, see “Post-installation requirements for NetBackup for MariaDB Agent” on page 14.

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]
   ```

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:

   \( \text{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:

   \( \text{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 exists on the specified client. When you do not specify the client, it defaults to the NetBackup master server.

### 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:

- (LVM users) Ensure that data logs and the logs directory reside on logical volumes
- 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.

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/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:

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

For more information, See “Redirected restores” on page 27.
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>
<thead>
<tr>
<th>Steps</th>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step1</td>
<td>Remember the error message</td>
<td>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.</td>
</tr>
</tbody>
</table>
Table 5-1  General steps to resolve problems (continued)

<table>
<thead>
<tr>
<th>Steps</th>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
</table>
| Step 2 | Identify what you were doing when the problem occurred. | Ask the following questions:  
- 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. | Capture potentially valuable information:  
- 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`
Troubleshooting for NetBackup for MariaDB

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 errors

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

<table>
<thead>
<tr>
<th>Problems</th>
<th>Description</th>
<th>Solution</th>
</tr>
</thead>
</table>
| The `nbmariadb` backup fails with the following error: `Unable to load mariadb library` | You may encounter this problem when the `nbmariadb.conf` file is not updated with the following: <ul><li>MARIADB_LIB_INSTALL_PATH</li><li>does not point to `libmariadb.so.<n>` library version.</li></ul> | Verify the following and then run the backup again:  
- Add or update the MariaDB library file location in the `nbmariadb.conf` file.  
- Ensure that the `MARIADB_LIB_INSTALL_PATH` is set to the correct path. It should point to `libmariadb` library version.  
- (Linux) Create a symbolic link `libmariadb.so` that points to the `libmariadb.so.<n>` library version. |

| The `nbmariadb` backup fails with the following error: `Unable to connect to the database` | The `nbmariadb` backup fails when the `nbmariadb.conf` file is updated with invalid username or port number. | To add the appropriate database user name and port number  
- Configure the appropriate database user name and port number in the `nbmariadb.conf` file or provide the parameters from the `nbmariadb` command line.  
For more information, see “The `nbmariadb.conf configuration file” on page 18. |
### Table 5-2  Troubleshooting NetBackup for MariaDB errors (continued)

<table>
<thead>
<tr>
<th>Problems</th>
<th>Description</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The <code>nbmariadb</code> backup fails with the following error:</strong>  &lt;br&gt;<code>Unable to load xbsa.dll</code></td>
<td>The <code>nbmariadb</code> backup fails if the environment variable path is not updated with NetBackup bin directory.</td>
<td>To run a <code>nbmariadb</code> backup  &lt;br&gt;■ Update the environment variable path with <code>NetBackup_install_path/bin</code>.</td>
</tr>
<tr>
<td><strong>The <code>nbmariadb</code> backup fails with the following error:</strong>  &lt;br&gt;<code>XBSA initiation failed</code></td>
<td>The <code>nbmariadb</code> backup fails if the <code>nbmariadb.conf</code> file is not updated with the required parameters.</td>
<td>To run the <code>nbmariadb</code> backup  &lt;br&gt;■ Configure the valid master server name, policy name, schedule type in the <code>nbmariadb.conf</code> file or from the command line.  &lt;br&gt;■ Verify if there are communication errors between the <code>nbmariadb</code> agent and the NetBackup master server. For more information see the NetBackup Administration guide.</td>
</tr>
<tr>
<td><strong>(Windows) VSS snapshot creation failed</strong></td>
<td>The <code>nbmariadb</code> backup may fail when the user does not have the privileges to run the <code>nbmariadb</code> operations.</td>
<td>Run <code>cmd.exe</code> in Administrator mode.</td>
</tr>
<tr>
<td><strong>The <code>nbmariadb</code> restore operation does not restore any data from the target NetBackup client.</strong></td>
<td>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.</td>
<td>For a successful restore  &lt;br&gt;■ Verify that the target directory is valid and empty.  &lt;br&gt;■ Initiate the restore from the NetBackup source client.  &lt;br&gt;■ Set the NetBackup client name and target directory parameters in the <code>nbmariadb.conf</code> file.</td>
</tr>
<tr>
<td><strong>The <code>nbmariadb</code> backup fails with the following error:</strong>  &lt;br&gt;<em>(Linux)</em> <code>Error creating LVM snapshot</code></td>
<td>The <code>nbmariadb</code> backup may fail when the volume group does not have sufficient space for the snapshot.  &lt;br&gt;<strong>To verify the space in the volume group</strong>  &lt;br&gt;1 To view the space in the volume, run the following command:  &lt;br&gt;<code>$vgs</code>  &lt;br&gt;The command displays the volume group details.  &lt;br&gt;2 Update the <code>nbmariadb.conf</code> file with the appropriate snapshot size. The snapshot should be equivalent to or more than the instance size.</td>
<td>To verify the space in the volume group  &lt;br&gt;<strong>1</strong> To view the space in the volume, run the following command:  &lt;br&gt;<code>$vgs</code>  &lt;br&gt;The command displays the volume group details.  &lt;br&gt;<strong>2</strong> Update the <code>nbmariadb.conf</code> file with the appropriate snapshot size. The snapshot should be equivalent to or more than the instance size.</td>
</tr>
</tbody>
</table>
### Table 5-2  Troubleshooting NetBackup for MariaDB errors (continued)

<table>
<thead>
<tr>
<th>Problems</th>
<th>Description</th>
<th>Solution</th>
</tr>
</thead>
</table>
| Error messages after a successful backup:                                 | The nbmariadb 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.  
| <volume_group>/<snapshot_name> Read failure after 0 of 4096 at 29393616896: input or output error. | **Note:** nbmariadb created LVM snapshot names are prefixed with mariadbsnap                                                                    | To remove the snapshots                                                                   |
| OR                                                                       |                                                                                                                                                                                                               | 1  To list the existing snapshot, run the following command: $lvs  
| <volume_group>/<snapshot_name>: read failure after 0 of 4096 at 4096: input or output error. | The command displays the snapshot details.                                                                                                                                                                   | 2  To remove the snapshots, run the following command: $ lvremove -f <volume_group>/<snapshot_name> |
| The nbmariadb backup fails with the following error:                     | You may encounter this problem when the nbmariadb.conf file is not updated with the following:  
| "Failed to load MariaDB Library"                                         | ■ MariaDB library file location.  
|                                                                           | ■ The MARIADB_LIB_INSTALL_PATH does not point to libmariadb.so.<n>                                                                                                                                      | Verify the following and then run the backup again:                                          |
|                                                                           | Add or update the MariaDB library file location in the nbmariadb.conf file.  
|                                                                           | For more information, See “The nbmariadb.conf configuration file” on page 18.                                                                                                                            |                                              |
|                                                                           | Ensure that the MARIADB_LIB_INSTALL_PATH is set to the absolute path of the symbolic link.                                                                                                                  |                                              |
|                                                                           | (Linux) Create a symbolic link libmariadb.so that points to the libmariadb.so.<n> library version.                                                                                                           |                                              |
|                                                                           | Ensure it points to libmariadb.so.<n>                                                                                                                                                                      | For more information, See "Post-installation requirements for NetBackup for MariaDB Agent" on page 14. |
The `nbmariadb` backup on Linux (LVM), fails with the following error:

*Error unmounting the snapshot-Device or resource busy*

OR

*Error removing the snapshot-mariadb_{timestamp}*

<table>
<thead>
<tr>
<th>Problems</th>
<th>Description</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>The <code>nbmariadb</code> backup on Linux (LVM), fails with the following error:</td>
<td>The <code>nbmariadb</code> backup fails during an attempt to unmount the snapshot, the device, or when you remove the existing snapshots.</td>
<td>To unmount the snapshot</td>
</tr>
<tr>
<td><em>Error unmounting the snapshot-Device or resource busy</em></td>
<td></td>
<td>1. To list all mounted file systems run the following command:</td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td>$ mount-l</td>
</tr>
<tr>
<td><em>Error removing the snapshot-mariadb_{timestamp}</em></td>
<td></td>
<td>2. If the snapshot still exists, create a mount directory using the following command:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$ mount&lt;mount_directory&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Note:</strong> This directory is created in /mnt/&lt;snapshot_name&gt;. The prefix names for snapshot are <code>pgsqlsnap</code>.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. To remove the mount directory run the following command:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$ rm -rf &lt;mount_directory&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. To remove the snapshot manually run the following command:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>lvremove -f &lt;volume_group&gt;/&lt;snapshot_name&gt;</td>
</tr>
</tbody>
</table>
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 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 parameter values 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 operation on the nbmariadb command line or in the nbmariadb.conf file. The parameters on the command line takes precedence over the nbmariadb.conf file.
The NetBackup for MariaDB command options

Table A-1  The nbmariadb command options

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

About NetBackup for MariaDB command conventions

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

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
```
The 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
(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 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

-1
  (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.
The NetBackup for MariaDB commands

nbmariadb -o backup

-s
Specifies the schedule name that you have configure for the DataStore policy.

-u
Configures the database user name.

-z
(LVM backups) Specifies the LVM snapshot size.
**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 – queries the backups performed for MariaDB database.

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/MariaDBAgent/

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

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