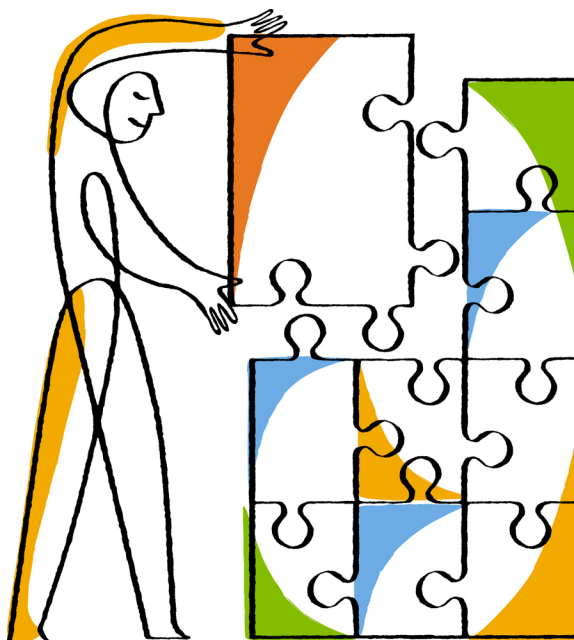




# NetApp® Recovery Manager 1.0 for Citrix® ShareFile®

## Installation and Administration Guide



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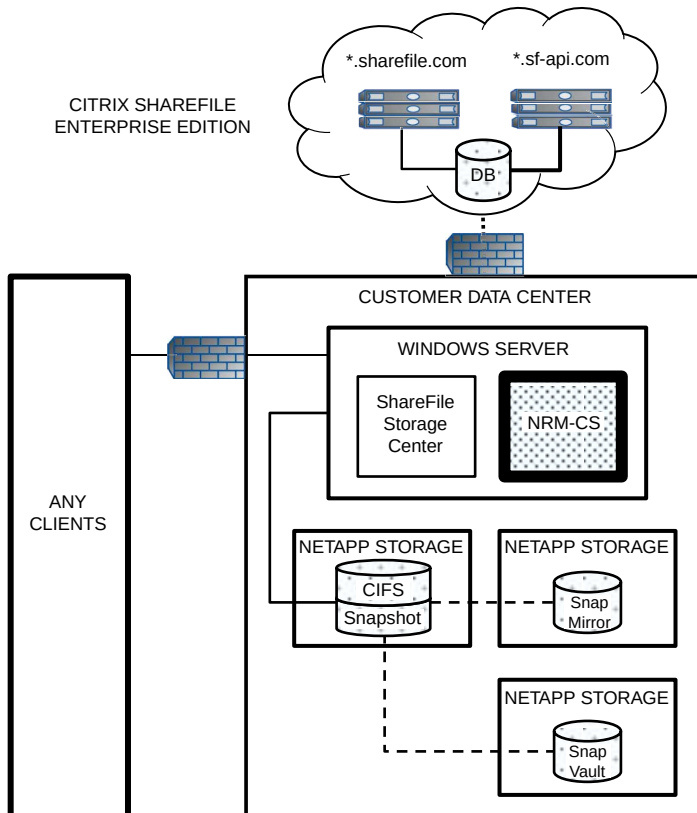
# NetApp Recovery Manager for Citrix ShareFile overview

NetApp® Recovery Manager for Citrix® ShareFile® (NRM-CS) provides a background service for Citrix ShareFile administrators to restore user files that have been removed from the Citrix Storage Center.

Designed to leverage the data protection and replication provided by Snapshot™, SnapVault®, and SnapMirror® technology, NRM-CS provides the ability to fully automate the file recovery process that has been previously performed manually by the administrator.

**Note:** For more information about Snapshot, SnapVault, and SnapMirror, see the documentation available on the NetApp Support Site, which is available online at [support.netapp.com](http://support.netapp.com).

Running as a background service, NRM-CS provides recovery functionality as shown in the following example of a Citrix ShareFile Enterprise Edition environment:



As shown in this example, NRM-CS provides the recovery functionality within the following workflow:

1. A ShareFile user requests a file restore from the ShareFile administrator.
2. The ShareFile administrator selects Restore through the ShareFile web user interface, creating an item in the recovery queue, which provides the information needed to restore the files from the Storage Center backup to the storage location.
3. NRM-CS reads the recovery queue and detects the old filename (the associated ID for the file); then searches for that file (by the associated ID) in Snapshot, SnapVault, and SnapMirror.
4. After the search process is complete, NRM-CS copies the file to a new filename on the CIFS volume as specified by the recovery queue; then the recovery queue is marked as "success" or "failure."
5. The ShareFile user receives the new filename through ShareFile.
  - If the recovery process succeeded, the file is uploaded with a new name under the directory previously specified by the user.
  - If the recovery process failed, the request for file recovery is removed from the queues.

**Note:** For more information about Citrix ShareFile and the recovery queue, refer to the Citrix ShareFile documentation.

For this initial release, NRM-CS contains the following features:

- Windows service to recover files from the following data protection and backup products:
  - Snapshot (Data ONTAP operating in 7-mode and clustered Data ONTAP)
  - SnapVault (Data ONTAP operating in 7-mode only)
  - SnapMirror (Data ONTAP operating in 7-mode and clustered Data ONTAP)
- Windows installation wizard, as well as the ability to install from a command line
- Easy-to-use graphical interface containing the following tabs:
  - **Configuration** tab, which provides the ability to configure the connection to your NetApp storage system by selecting the underlying volumes on the array and establishing the SnapVault and SnapMirror relationships through the use of the Configuration wizard.
  - **Summary** tab, which displays the current configuration settings, such as controller credentials (hostname or IP address), recovery queue status (detected or not), volume name, polling interval, and associated SnapVault, and SnapMirror information.
  - **Logs** tab, which displays the associated service logs.
  - **About** tab, which displays version information about the installed product.

For detailed information about the Citrix ShareFile Enterprise Edition and the NetApp storage solution, refer to the NetApp Technical Report TR-4124: *Citrix ShareFile StorageZones on NetApp Solution Guide*.

**Related information**

*[TR 4124: Citrix ShareFile StorageZones on NetApp Solution Guide.pdf](#)*

# Installation overview

---

You can install NetApp Recovery Manager for Citrix ShareFile on a 32-bit or 64-bit Windows computer that has Citrix ShareFile installed.

To install the NRM-CS software, follow these guidelines:

- NRM-CS must be installed on the same server as the Citrix ShareFile Storage Center.
- NRM-CS is a 32-bit application. When installing on a 32-bit system, the default installation directory is C:\Program Files. When installing on a 64-bit system, the default directory is C:\Program Files (x86). During a silent (unattended) install, you cannot force installation to the Program Files directory on a 64-bit system.
- A reboot of the Windows computer is not required to complete the installation or uninstall process.

## Installation requirements and configuration information

Before you install NetApp Recovery Manager for Citrix ShareFile, you should be aware of the following requirements and configuration information.

### License requirements

In order to restore files from local Snapshots, SnapVault, and SnapMirror destinations, the following licenses may be required, depending on your environment:

- cifs (ShareFile only supports CIFS shares)
- snaprestore (for cloning files from Snapshot into the active file system)
- snapvault (to enumerate SnapVault information and restore files from SnapVault)
- snapmirror (to enumerate SnapMirror information and restore files from SnapMirror)

### Software requirements

The following software is required for use with NRM-CS:

- .NET Framework
- PowerShell
- Citrix ShareFile
- Microsoft Windows software

See the Interoperability Matrix, which is online at [support.netapp.com/NOW/products/interoperability](http://support.netapp.com/NOW/products/interoperability), for details regarding the supported software and associated versions.

## Hardware requirements

Refer to the Citrix ShareFile hardware requirements. The NRM-CS software supports these minimum hardware requirements.

There should be at least 20 MB of space available for the NetApp Recovery Manager for Citrix ShareFile.

# Installing NRM-CS using the installation wizard

You can use the installation wizard to install the NRM-CS software.

## Before you begin

You must be logged on with administrator privileges to the machine where you are installing NRM-CS.

NRM-CS must be installed on the same server as the Citrix ShareFile Storage Center. For environments running multiple instances of Citrix ShareFile Storage Center, only a single server should receive NRM-CS.

Before installing NRM-CS, make sure that the following are installed on the machine:

- .NET Framework
- PowerShell

**Note:** For specific information regarding these requirements, refer to the topic *Installation requirements and configuration information*.

## About this task

To install the NRM-CS using the installation wizard, perform the following steps.

## Steps

1. Download the NRM-CS installer (NRM-CS.1.0.msi).
2. Double-click the installer icon, and click **Run** to start the installation wizard.
3. Follow the instructions in the installation wizard to install the software.

**Note:** When choosing the installation location, select the default installation directory as the destination for NRM-CS (for example, C:\Program Files\NetApp).

4. Click **Finish** to complete the installation.

**Note:** If you want to configure the product immediately after the installation is complete, make sure to select the **Launch Configuration Tool** check box.

## Result

As a result of using the installation wizard, an `install.log` file is not generated. If you need to have an `install.log`, install NRM-CS from a command line. For more information, see topic *Installing NRM-CS from a command line*.

Also, if you selected the **Launch Configuration Tool** check box in the last screen of the installation wizard, the Recovery Manager Configuration window opens, allowing you to connect to the NetApp storage system. For information, refer to the topic *Configuring the storage system connection*.

## Related concepts

*Installation requirements and configuration information* on page 7

## Related tasks

*Installing NRM-CS from a command line* on page 9

*Configuring the storage system connection* on page 14

# Installing NRM-CS from a command line

You can install NRM-CS from a command line instead of using the installation wizard.

## Before you begin

You must be logged on with administrator privileges to the machine where you are installing NRM-CS.

NRM-CS must be installed on the same server as the Citrix ShareFile Storage Center. For environments running multiple instances of Citrix ShareFile Storage Center, only a single server should receive NRM-CS.

Before installing NRM-CS, make sure that the following are installed on the machine:

- .NET Framework
- PowerShell

**Note:** For specific information regarding these requirements, refer to the topic *Installation requirements and configuration information*.

## About this task

Typically, you will install from a command line to take advantage of performing the install in silent mode (using the `/qn` option) where no user interface, progress bars, or error messages are displayed during the process, as well as having the ability to request an installer log file.

**Note:** An `install.log` is not generated when using the installation wizard.

To install the NRM-CS from a command line, perform the following steps.

## Steps

1. Download the NRM-CS installer (NRM-CS.1.0.msi).
2. From a command line prompt, switch to the directory where you saved the executable file.
3. Run the following command, which includes the options for an installer log file, silent mode, and specifying an installation directory other than the default directory:

```
start /wait msixexec /l*v install.log /qn /i NRM-CS.1.0.msi
INSTALLDIR=C:\XYZ
```

Where:

- `start /wait` prevents the command from returning until the installation is complete.
- *(optional)* `/l*v install.log` generates an installer log file (`install.log`), which is recommended for a silent install for possible debugging issues.
- *(optional)* `/qn` is the silent mode flag.

**Note:** If you want the Recovery Manager Configuration window to open after the installation is complete so that you can configure the product, do not include this option in your command. You will have the option to select the **Launch Configuration Tool** check box in the last screen of the installation wizard.

- `/i filename` informs msixexec which file to install.
- *(optional)* `INSTALLDIR=C:\XYZ` specifies the installation directory instead of accepting the default directory.

**Note:** For more command line options, enter `msixexec /?` at the command prompt.

The installation begins and runs in the background.

**Note:** If you did not use the silent mode option (`/qn`), follow the instructions in the installation wizard to install the software.

## Result

In this example, because the `/l*v install.log` was inserted in the command, the `install.log` file containing the actions performed during the installation process is generated and placed in the installation directory (in this example, `C:\XYZ`). In addition, this file also contains any errors that occur during this process, together with their associated messages.

If you ran the command in silent mode, you will need to select the **Configure Recovery Manager** option in the **Start** menu to configure the connection to the NetApp storage system.

**Note:** If you did not run the command in silent mode and selected the **Launch Configuration Tool** check box, the Recovery Manager Configuration window automatically opens to the **Configuration** tab, allowing you to configure the connection to the NetApp storage system.

For information, refer to the topic *Configuring the storage system connection*.

### Related concepts

[Installation requirements and configuration information](#) on page 7

### Related tasks

[Configuring the storage system connection](#) on page 14

## Uninstalling NRM-CS using Remove/Uninstall programs

You can uninstall the NRM-CS software using the Windows Remove or Uninstall Programs list.

### Before you begin

You must be logged on with administrator privileges to the machine where you are uninstalling NRM-CS.

### About this task

The uninstall process removes the NRM-CS application. However, the logs and data files are not removed automatically during this process; when uninstalling with the Windows remove programs feature, you will be prompted as to whether you want to remove these files or leave them (the default option).

**Note:** For more information about the command line process, see the topic *Uninstalling NRM-CS from a command line*.

To uninstall the NRM-CS using the Windows remove program, perform the following steps.

### Steps

1. On the machine where the NRM-CS software is installed, navigate to the Windows Control Panel and using the applicable remove or uninstall feature, select **NetApp Recovery Manager 1.0 for Citrix ShareFile**.

For details on how to use the Windows remove programs feature to uninstall programs, see the documentation for your Windows operating system.

2. Click the uninstall or remove option.

An uninstall prompt appears.

3. Follow the prompts to remove the application and logs and data files.

### Result

As a result of using the Windows Remove/Uninstall program, an `uninstall.log` file is not generated. If you need to have an `uninstall.log`, uninstall NRM-CS from a command line. For more information, see topic *Uninstalling NRM-CS from a command line*.

**Related tasks**

[Uninstalling NRM-CS from a command line](#) on page 12

## Uninstalling NRM-CS from a command line

You can uninstall NRM-CS from a command line instead of using the Windows Remove/Uninstall Program. From the command line, you can uninstall the entire NRM-CS at the same time.

**Before you begin**

You must be logged on with administrator privileges to the machine where you are uninstalling NRM-CS.

**About this task**

You would typically uninstall from a command line to take advantage of performing the uninstall in silent mode (using the `/qn` option) where no user interface, progress bars, or error messages are displayed during the process.

In addition, uninstalling from a command line provides the ability, by using the applicable optional commands, to remove all of the associated data files and to request an uninstall log file.

**Note:** When using the Windows Remove/Uninstall programs, an uninstall log file is not generated.

To uninstall the NRM-CS from a command line, perform the following steps.

**Step**

1. On the machine where the NRM-CS software is installed, from a command line prompt, run the following command, which includes the options for an uninstall log file, silent mode, and removing the data and log files:

```
start /wait Msiexec /l*v uninstall.log /qn /x NRM-CS.1.0.msi  
REMOVECONFIGFILES=1
```

Where:

- `start /wait` prevents the command from returning until the uninstall is complete.
- *(optional)* `/l*v uninstall.log` generates an uninstall log file (*uninstall.log*), which is recommended for a silent uninstall for possible debugging issues.

**Note:** If needed, you can specify a directory for this file other than the current directory (for example, `/l*v C:\uninstall.log`).

- *(optional)* `/qn` is the silent mode flag.
- `/x filename` informs msiexec which file to uninstall.
- *(optional)* `REMOVECONFIGFILES=1` informs the uninstaller to remove the data and log files.

**Note:** For more command line options, enter `msiexec /?` at the command prompt.

## Result

In this example, because the `/l*v uninstall.log` was inserted in the command, the `uninstall.log` file containing the actions performed during the uninstall process is generated and placed in the current directory. In addition, this file also contains any errors and associated messages that might occur during this process.

## Configuring NRM-CS overview

---

You can configure NetApp Recovery Manager for Citrix ShareFile by using the Configuration wizard to connect to your NetApp storage system. You can use the same wizard to edit this configuration at a later date. You also have the capability to view the existing NRM-CS configuration. In addition, you have the option of managing user roles and access by implementing role-based access control (RBAC) by utilizing various Zephyr APIs (ZAPIs).

The Configuration wizard can be accessed either immediately after the installation process by selecting the **Launch Configuration Tool** check box on the last screen of the installation wizard or after the installation has been completed by selecting the **Configure Recovery Manager** option from the **Start** menu.

## Configuring the storage system connection

Using the Configuration wizard, you can configure the connection to the NetApp storage system.

### Before you begin

Before you can configure NRM-CS, the Citrix Storage Center must be set up, which requires the setup of the NetApp storage controller and volume, and the CIFS share, as well as any applicable SnapVault and SnapMirror relationships. In addition, applicable licenses must be installed on the storage controller. For more information, refer to the topic *Installation requirements and configuration information*.

### About this task

From the **Configuration** tab, you can access Configuration wizard to set the initial configuration, as well as edit the existing configuration:

1. Connect to the NetApp storage controller.
2. Select the appropriate volume.
3. Establish the connection to the applicable data storage products (SnapVault and SnapMirror).

**Note:** If you do not have SnapVault or SnapMirror in place, skip this step.

4. Specify the polling interval of the Recovery Queue, as well as create this queue if needed.

To configure NRM-CS, perform the following steps.

**Note:** The Recovery Manager Configuration window must be open. If you selected the **Launch Configuration Tool** check box in the installation wizard, this window is automatically opened. If you did not select this check box or installed the product in silent mode, select the **Configure Recovery Manager** option from the **Start** menu.

## Steps

1. In the **Recovery Manager Configuration** window, enter the login information (hostname or IP address and login credentials) for the storage controller to which you want to connect; then click **Next**.

The service detects whether this storage controller is running Data ONTAP operating in 7-mode or clustered Data ONTAP and prompts you to specify the volume.

2. Select the appropriate volume; then click **Next**.

Depending on the controller operating mode, you are prompted to provide configuration information to the associated data recovery products (SnapVault and SnapMirror).

3. Specify the configuration information as needed; then click **Next**.

**Note:** If you do not have SnapVault or SnapMirror in place, skip this step.

The wizard displays the **Recovery Queue Creation** screen.

4. Select the time interval (in minutes) that the NRM-CS polls the Recovery queue.

If the Recovery queue is not detected, you can create the queue.

## Result

If you correctly provided the requested information, the **Summary** tab displays the provided information. NRM-CS loads the configuration and runs in the background. You can close the Recovery Manager Configuration window.

## Related concepts

[Installation requirements and configuration information](#) on page 7

# Viewing configuration summary

You can view the current configuration settings for NRM-CS by using the **Summary** tab.

## About this task

To view the current configuration, perform the following steps.

## Steps

1. Select **Start > Configure Recovery Manager**.

The Recovery Manager Configuration window opens.

2. Select the **Summary** tab.

The current configuration for NRM-CS displays.

## Role Based Access Control for NRM-CS

Role-based access control (RBAC) is optional; however, the implementation of RBAC is recommended if you want to manage user roles and access. Otherwise, you can use root or full permission on the NetApp storage controller.

The RBAC operation for NetApp Recovery Manager for Citrix ShareFile is implemented by the use of ZAPIs on the storage controller side. RBAC also requires permissions associated with the administrator role on the Citrix ShareFile side.

The following ZAPIs and commands or directories are used to manage the storage controllers:

- Data ONTAP operating in 7-Mode
  - ems-autosupport-log
  - file-get-file-info
  - options-get
  - snapmirror-get-status
  - snapshot-list-info
  - snapshot-restore-file
  - snapvault-secondary-destinations-list-info
  - system-cli
  - system-get-info
  - volume-list-info
- Clustered Data ONTAP
  - Read-only commands/directories:
    - storage aggregate show
    - volume file show-disk-usage
    - network interface show
    - vservers options
    - snapmirror show
    - volume snapshot show
    - system node show
    - volume show
  - Read-write commands/directories:
    - volume file show-disk-usage
    - system node
    - system node run

# Troubleshooting and logging

---

This section provides information about NetApp Recovery Manager for Citrix ShareFile error codes and mitigation, as well as support logs.

## Troubleshooting

This section provides information about error codes and mitigation.

### Error codes and mitigation

Various error codes and messages might be generated as you use NRM-CS.

Each error message is comprised of a four-digit unique identifier, along with the message. For example:

Error 1000

Uncaught Exception

**Note:** For error codes that are displayed through the user interface, the unique identifier is displayed in the dialog box title bar, along with the message.

The following table lists the NRM-CS error codes in numerical order, along with their associated messages and resolutions.

| Error Code | Message                                                          | Resolution                                                                                                                                                                                                                          |
|------------|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1000       | Uncaught Exception                                               | A fatal uncaught exception occurred, and the program was terminated.<br>Collect the logs (see topic <i>Exporting log files</i> ) and contact NetApp Technical Support.                                                              |
| 1001       | Incorrect credentials for <i>hostname</i> or <i>IP address</i> . | You entered the incorrect username or password when logging in to the storage controller.<br>Access the Configuration wizard and enter the correct login credentials (see topic <i>Configuring the storage system connection</i> ). |
| 1002       | ConnectionException                                              | Unable to connect to storage controller.<br>Check the network settings.                                                                                                                                                             |

| Error Code | Message                                              | Resolution                                                                                                                                                                                                  |
|------------|------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1003       | ConnectionTimeoutException                           | Network timeout connecting to the storage controller.<br>Verify that the storage controller is running.                                                                                                     |
| 1004       | Error connecting to controller                       | Miscellaneous error talking to storage controller.<br>Collect the logs (see topic <i>Exporting log files</i> ) and contact NetApp Technical Support.                                                        |
| 1005       | You must connect to the cluster management interface | Login to the cluster management interface instead of Vserver.                                                                                                                                               |
| 1006       | Exception detecting queue                            | The Storage Center recovery queue was not detected.<br>Install the ShareFile Storage Center, and verify connectivity. For more information, refer to the Citrix ShareFile documentation.                    |
| 1007       | Error creating the queue                             | Problem creating the Storage Center Recovery Queue.<br>Reinstall the ShareFile Storage Center, and verify connectivity. For more information, refer to the Citrix ShareFile documentation.                  |
| 1008       | Error getting work items                             | Problem reading the Storage Center Recovery Queue to get work items.<br>Reinstall the ShareFile Storage Center, and verify connectivity. For more information, refer to the Citrix ShareFile documentation. |
| 1009       | Error saving work item                               | Problem saving the work item.<br>Re-install the ShareFile Storage Center, and verify connectivity. For more information, refer to the Citrix ShareFile documentation.                                       |

| Error Code | Message                                                         | Resolution                                                                                                                                    |
|------------|-----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| 1010       | Exception saving config {0}                                     | Problem saving the configuration.<br>Verify that nothing is interfering with loading or saving the configuration file (settings.json).        |
| 1011       | Exception deserializing config {0}                              | Problem loading the configuration.<br>Verify that nothing is interfering with loading or saving the configuration file (settings.json).       |
| 1012       | Error logging to EMS                                            | Problem writing to the EMS log.<br>Verify the storage controller connection.                                                                  |
| 1013       | Snapshot File Restore Error: from {0} to {1}                    | Problem restoring the file from Snapshot.<br>Collect the logs (see topic <i>Exporting log files</i> ) and contact NetApp Technical Support.   |
| 1014       | Problem restoring file: from ndmp {0} at {1} to ndmp {2} at {3} | Problem restoring the file from SnapVault.<br>Collect the logs (see topic <i>Exporting log files</i> ) and contact NetApp Technical Support.  |
| 1015       | Problem restoring file: from ndmp {0} at {1} to ndmp {2} at {3} | Problem restoring the file from SnapMirror.<br>Collect the logs (see topic <i>Exporting log files</i> ) and contact NetApp Technical Support. |
| 1016       | Unable to get snapmirrors                                       | Not able to get snapmirrors.<br>Verify SnapMirror license on Data ONTAP operating in 7-mode.                                                  |
| 1017       | Unable to get snapvaults                                        | Not able to get snapvaults.<br>Verify SnapVault license on Data ONTAP operating in 7-mode.                                                    |
| 1018       | Unable to get aggr name for volume                              | Not able to get aggr name.<br>Verify the storage system configuration.                                                                        |

| Error Code | Message                                                                               | Resolution                                                                                                                                    |
|------------|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| 1019       | Unable to get node management interface for node                                      | Not able to get node management interface.<br>Verify connection to the clustered system.                                                      |
| 1020       | Error getting configuration info                                                      | Not able to get system info from controller.<br>Verify connection to the storage system.                                                      |
| 1021       | Snapshot File Restore Error: from {0} to {1} on vserver {2}, volume {3}, snapshot {4} | Problem restoring the file from Snapshot.<br>Collect the logs (see topic <i>Exporting log files</i> ) and contact NetApp Technical Support.   |
| 1022       | Problem restoring file: from ndmp {0} at {1} to ndmp {2} at {3}                       | Problem restoring the file from SnapMirror.<br>Collect the logs (see topic <i>Exporting log files</i> ) and contact NetApp Technical Support. |
| 1023       | Unable to get NDMP status for node {0}                                                | Problem getting NDMP status from CLI.<br>Verify connection to the clustered system.                                                           |
| 1024       | Unable to get snapmirrors                                                             | Problem getting snapmirrors.<br>Verify SnapMirror license on clustered Data ONTAP.                                                            |
| 1025       | Unable to start ndmpd on node {0}                                                     | Problem starting NDMPD.<br>Verify node NDMPD configuration.                                                                                   |
| 1026       | Unable to stop ndmpd on node {0}                                                      | Problem stopping NDMPD.<br>Verify node NDMPD configuration.                                                                                   |

**Related tasks**

[Configuring the storage system connection](#) on page 14

[Exporting log files](#) on page 21

## Support log files

NRM-CS uses the service log file (`RecoveryManager.Service.log`) to record detailed information regarding event messages and errors.

The service log file is contained in the `logs` directory (`C:\ProgramData\NetApp\NetApp Recovery Manager for Citrix ShareFile\logs`).

This file contains the timestamp of each message, as well as a short descriptive message. Each log file contains 10 MB of data before a new file is created, and a maximum of 10 files is retained before the logs are rotated.

## Viewing log files

You can view the service log file for information about event messages.

### About this task

To view the available log files, perform the following steps.

### Steps

1. Select **Start > Configure Recovery Manager**.

The Recovery Manager Configuration window opens.

2. Select the **Logs** tab.

The service log file is listed.

### Result

From the **Logs** tab, you can perform any of the following actions:

- Refresh the service log file.
- Open the `log` directory.
- Export the listed support log files in a `.zip` file.

## Exporting log files

You can export all of the associated service log files to a directory of your choice.

### About this task

When exporting the log files, the entire `logs` directory (which includes the `RecoveryManager.Service.log`) is saved to a `.zip` file to a location of your choice.

To export the log files, perform the following steps.

### Steps

1. Select **Start > Configure Recovery Manager**.

The Recovery Manager Configuration window opens.

2. Select the **Logs** tab.

The available service log files are listed.

3. Click **Zip Log Files**.

The Save as dialog box opens.

4. Locate the directory to where you want to save the .zip file and click **Save**.

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