IBM System Storage N series

Snap Creator Framework 3.5.0 Installation and Administration Guide

Contents

Preface

Supported features

IBM System Storage N series storage systems are driven by NetApp Data ONTAP software. Some features described in the product software documentation are neither offered nor supported by IBM. Please contact your local IBM representative or reseller for further details.

Information about supported features can also be found on the N series support website (accessed and navigated as described in *Websites* on page 7).

Websites

IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. The following web pages provide N series information:

- A listing of currently available N series products and features can be found at the following web page:

  www.ibm.com/storage/nas/
- The IBM System Storage N series support website requires users to register in order to obtain access to N series support content on the web. To understand how the N series support web content is organized and navigated, and to access the N series support website, refer to the following publicly accessible web page:

  www.ibm.com/storage/support/nseries/

  This web page also provides links to AutoSupport information as well as other important N series product resources.
- IBM System Storage N series products attach to a variety of servers and operating systems. To determine the latest supported attachments, go to the IBM N series interoperability matrix at the following web page:

  www.ibm.com/systems/storage/network/interophome.html
- For the latest N series hardware product documentation, including planning, installation and setup, and hardware monitoring, service and diagnostics, see the IBM N series Information Center at the following web page:

  publib.boulder.ibm.com/infocenter/nasinfo/nseries/index.jsp

Getting information, help, and service

If you need help, service, or technical assistance or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you. This section contains

information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your IBM N series product, and whom to call for service, if it is necessary.

Before you call

Before you call, make sure you have taken these steps to try to solve the problem yourself:

- Check all cables to make sure they are connected.
- Check the power switches to make sure the system is turned on.
- Use the troubleshooting information in your system documentation and use the diagnostic tools that come with your system.
- Refer to the N series support website (accessed and navigated as described in *Websites* on page 7) for information on known problems and limitations.

Using the documentation

The latest versions of N series software documentation, including Data ONTAP and other software products, are available on the N series support website (accessed and navigated as described in *Websites* on page 7).

Current N series hardware product documentation is shipped with your hardware product in printed documents or as PDF files on a documentation CD. For the latest N series hardware product documentation PDFs, go to the N series support website.

Hardware documentation, including planning, installation and setup, and hardware monitoring, service, and diagnostics, is also provided in an IBM N series Information Center at the following web page:

publib.boulder.ibm.com/infocenter/nasinfo/nseries/index.jsp

Hardware service and support

You can receive hardware service through IBM Integrated Technology Services. Visit the following web page for support telephone numbers:

www.ibm.com/planetwide/

Firmware updates

IBM N series product firmware is embedded in Data ONTAP. As with all devices, ensure that you run the latest level of firmware. Any firmware updates are posted to the N series support website (accessed and navigated as described in *Websites* on page 7).

> **Note:** If you do not see new firmware updates on the N series support website, you are running the latest level of firmware.

Verify that the latest level of firmware is installed on your machine before contacting IBM for technical support.

How to send your comments

Your feedback helps us to provide the most accurate and high-quality information. If you have comments or suggestions for improving this document, please send them by e-mail to *starpubs@us.ibm.com*.

Be sure to include the following:

- Exact publication title
- Publication form number (for example, GC26-1234-02)
- Page, table, or illustration numbers
- A detailed description of any information that should be changed

Snap Creator overview

Snap Creator is a backup and recovery software solution that enables you to integrate Snapshot technology with any application that is not supported by SnapManager products.

Snap Creator is platform and operating system independent. It provides application integration through plug-ins that enable it to support any application on a storage system. Snap Creator uses the plug-ins to handle quiesce and unquiesce actions for a given application or database.

Snap Creator supports application plug-ins for Oracle, DB2, MySQL, Sybase ASE (Sybase), Lotus Domino (Domino), SnapManager for Microsoft SQL Server, SnapManager for Microsoft Exchange, MaxDB, and VMware (vSphere and vCloud Director). Additional application plug-ins are available through the Snap Creator Community.

Snap Creator provides a management interface for Snapshot technology, SnapVault, Open Systems SnapVault, SnapMirror, Protection Manager, Operations Manager, and FlexClone technology.

Architecture of Snap Creator

Snap Creator consists of a server and agent layer. The GUI, configuration, and CLI reside in the server layer. The agent runs remotely or locally and allows the Snap Creator Server to send quiesce or unquiesce operations to a given database.

The communication layer from the agent to the server is Simple Object Access Protocol (SOAP) over HTTP.

The following illustration shows the Snap Creator architecture:
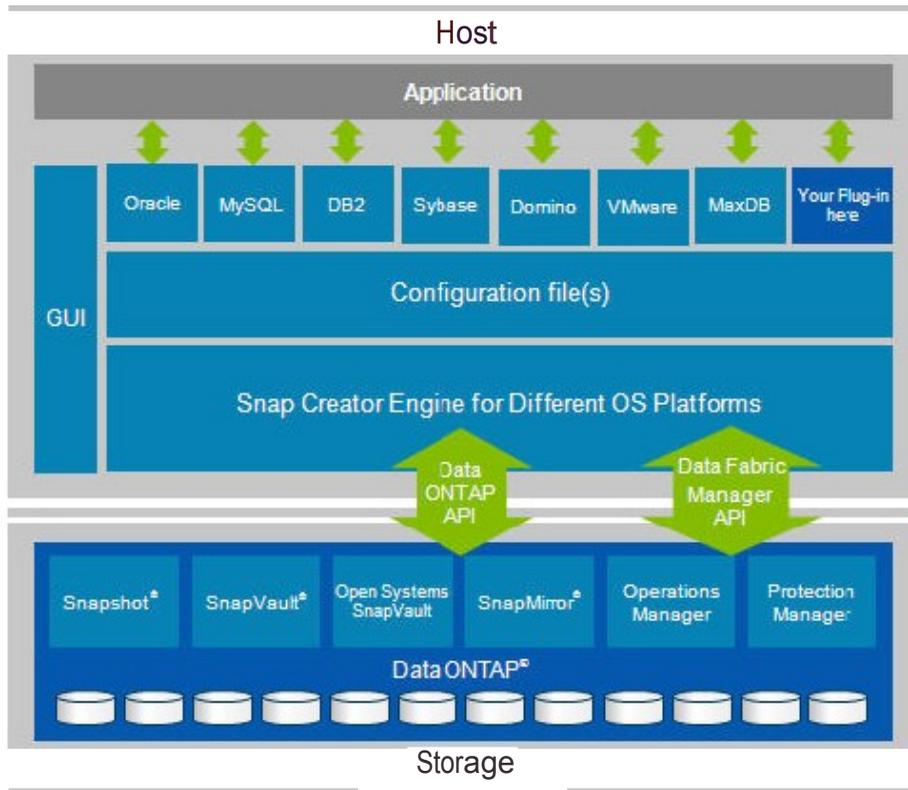
New features of Snap Creator

Snap Creator 3.5.0 introduces new features such as support for the MaxDB plug-in and GUI support for multiple users.

The following are the new features:

- Compatibility with Data ONTAP 8.1 Cluster-Mode and 7-Mode
- Data ONTAP 8.1 Cluster-Mode support for the following plug-ins:

  - Oracle
  - DB2
  - Lotus Domino (Domino)
  - Sybase ASE (Sybase)
  - MaxDB
  - MySQL
  - VMware (vSphere and vCloud Director)
- Enhancements to the following Domino plug-ins:

  - Support for IBM AIX (64-bit)
  - Ability to disable replication
  - Up-to-the-minute restore (Single file restore)
  - Point-in-time restore (Single file restore)
  - No log option
- Open Systems SnapVault support with Snap Creator Agent
- Support for recursive archive log deletion within subdirectories
- DataFabric Manager server proxy through GUI
- GUI support for job monitoring
- Ability to set all configuration parameters through GUI
- Ability to send an alert without exiting
- Ability to display a warning message if Snapshot copies are not deleted
- UNIX services
  This feature offers a start script for the Snap Creator Server and Snap Creator Agent. The start scripts are written in UNIX shell script (bourne shell) and are designed to run on all UNIX environments supported by Snap Creator.
- GUI support for Data ONTAP 8.1 Cluster-Mode:

  - GUI prompts the user to enter cluster credentials if it discovers that the storage system details entered are of a Cluster-Mode Vserver.
  - GUI detects SnapMirror relationships and prompts the user to enter destination Vserver and cluster authentication details.
  - Users can see volume, volume clone, and Snapshot data for Cluster-Mode configurations.

- EMS logging for AutoSupport data mining
- Cluster-Mode EMS logging for AutoSupport data mining
- Operating system or file system plug-in

Security features of Snap Creator

Snap Creator provides security features, such as RBAC for Storage controller, Host security for Snap Creator Agent, and RBAC for Snap Creator users through GUI.

RBAC for Storage controller
If you are not using DataFabric Manager server proxy, you need a user name and password to communicate with storage controllers. Passwords can be encrypted so that they are not saved in clear text.

The following are the minimum permissions that Snap Creator might require:

- login-* (for all login access) or login-http-admin (to only allow API login)
- api-snapshot-* (always required)
- api-system-* (always required)
- api-ems-* (always required)
- api-snapvault-* (required only for SnapVault management)
- api-snapmirror-* (required only for SnapMirror management)
- api-volume-* (required for volume clones)
- api-lun-* (required for volume and LUN clones)
- api-cg-* (required for Consistency Group Snapshot copies)
- api-nfs-* (required for exporting cloned volumes by using NFS)
- api-file-* (required for listing the files during single file restore)
- api-license-* (required for retrieving license information)
- api-net-* (required for the VMware plug-in)

   Note: Do not use the root user credentials. You should create a backup user with only the necessary API permissions.

Network communications are done through HTTP (80) or HTTPS (443), so you must have one or both of these ports open between the host where Snap Creator runs and the storage controllers. A user must be created on the storage controllers for authentication purpose. In the case of HTTPS, ensure that the user is enabled and configured on the storage controllers.

Snap Creator Agent security
Snap Creator uses host security to allow only authorized hosts to access the agent. Additionally, it checks the user name or password if you are not using a Snap Creator Server to communicate with the agent. This feature allows you to specify multiple host lines. To restrict access for third party applications through SOAP, the agent offers a user/password authentication.

If a command contains the path of the Snap Creator installation directory, it is blocked.

RBAC for Snap Creator users through GUI
You can create and manage multiple user accounts within Snap Creator GUI. The existing user in the GUI (which is created during installation or profile setup) acts as a super user and has access to the

complete system. The ability to assign a set of profiles restricts a user to operate in a defined area. This is useful in a multi-tenant environment.

There are four types of users:

- **Super user:** Has access to everyone's work space and is the only user that can create users and profiles. The super user can perform actions, such as the following:

  - Adding a new user by assigning user name and password
  - Changing password for a user
  - Assigning a set of GUI actions to the user
  - Reviewing the list of users and the profiles and actions that they can perform
- **Admin user:** Has access to a set of profiles and can perform all actions without any restrictions on those profiles.
- **Read-only user**: Has access to a set of profiles but can only perform a set of read-only operations. This user cannot perform write or execute operations like creating a Snapshot copy or creating a configuration.
- **Custom user:** Has access to a set of profiles and a set of actions.

The user can be assigned the following list of GUI actions:

- Add Schedule
- Administrator
- Archive Log
- Create Configuration
- Delete Configuration
- Delete Schedule
- Delete Snapshot
- Discover
- Download Configuration
- LUN Clone
- Quiesce
- Read Only
- Rename Configuration
- Rename Snapshot
- Restore
- Run Schedule
- Scdump
- Snapshot
- Unquiesce
- Update Configuration
- Update Schedule
- Upload Configuration
- Volume Clone

Note: Multiple users can simultaneously sign in to the GUI and perform operations but it is recommended that not more than 10 users are signed in at the same time.

Snap Creator Integration

Snap Creator integrates either fully or optionally with other software products and technologies.

- Optionally integrates with both SnapDrive for UNIX and SnapDrive for Windows
  If SnapDrive is used instead of Manage ONTAP Solution, which sends a call to the storage controller for the Snapshot copy, Snap Creator runs SnapDrive.
- Optionally uses SnapVault directly instead of Protection Manager to transfer Snapshot copies to secondary
- Snapshot, SnapVault, SnapMirror, LUN cloning, volume cloning, and igroup mapping using Data ONTAP API
- Any application or database that runs in an open systems environment (you can write the application backup script or plug-in if one does not exist)
- NetBackup, CommVault, or any backup software with CLI commands
- Optionally integrates with Operations Manager for monitoring (the ability to create events in Operations Manager)
- Optionally integrates with Protection Manager to perform secondary backup (Snap Creator backup copies can be registered in Protection Manager)
- Optionally integrates with Open Systems SnapVault

Note: Snap Creator 3.5.0 does not support SnapVault, Operations Manager, Protection Manager, and Open Systems SnapVault on Data ONTAP 8.1 Cluster-Mode.

Snap Creator Policies

A policy defines the number of Snapshot copies that you want to keep and the Snapshot copy age. Snap Creator policies are user-defined Snapshot copy retentions that apply to Snapshot copies on primary storage and SnapVault Snapshot copies on secondary storage.

You must define at least one policy in the NTAP_SNAPSHOT_RETENTIONS configuration parameter. For SnapVault, you can associate the same policy with different SnapVault retention periods.

For example, if you want to create daily Snapshot copies and retain them for seven days on primary storage and one month on secondary storage, use the following options:

NTAP_SNAPSHOT_RETENTIONS=*daily*:7

NTAP_SNAPVAULT_RETENTIONS=*daily*:28

You can also specify the minimum age of a Snapshot copy (in days) to ensure that Snapshot copies are deleted only if they are older than the minimum age, regardless of how many Snapshot copies exist in a given volume. Using the preceding example of seven days for Snapshot copies and one month for SnapVault Snapshot copies, use the following options:

NTAP_SNAPSHOT_RETENTION_AGE=7

NTAP_SNAPVAULT_RETENTION_AGE=28

Additionally, you can specify the Snapshot copy deletion by age only using the following option:

NTAP_SNAPSHOT_DELETE_BY_AGE_ONLY=Y

Note: Although you can define multiple policies, Snap Creator can run only one policy at a time.

The maximum age value is a global parameter and it applies to all the policies. To configure an additional weekly policy, define it, and then call it in Snap Creator once a week using Cron or task manager with SNAP_TYPE set to Weekly.

What Snap Creator Agent is

The Snap Creator Agent is a lightweight daemon that runs remotely or locally and allows the Snap Creator Server to send quiesce or unquiesce operations to a given database.

The Snap Creator Agent remotely handles operations on application through the plug-ins. All Snap Creator configurations are stored centrally on the Snap Creator Server and all backup jobs can be scheduled from the same host. This provides a single pane of glass (SPOG) for backup and restore.

The following illustration shows the Snap Creator Agent architecture:
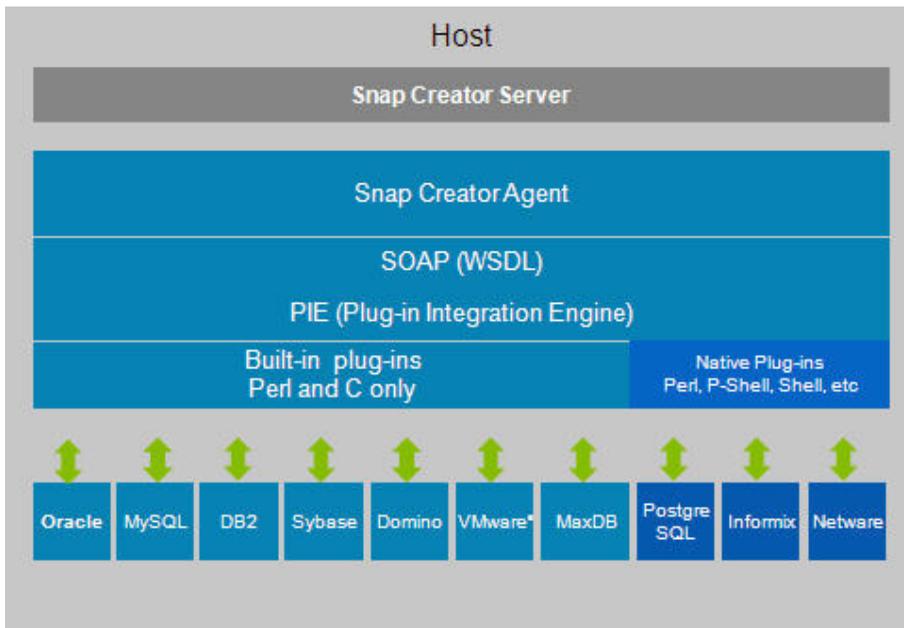
Snap Creator uses the Snap Creator Agent, which runs as a daemon, to quiesce the application. The default port used is 9090, but any other port can also be used.

SOAP is used over the HTTP for communication. Based on a WSDL, any SOAP client can interact with the agent. Currently, Apache CXF (for Java) and PowerShell (for Windows) can be used. The supported application plug-ins are built into the agent.

Other community plug-ins are available as source codes and can be added to the `/plug-ins` directory. In addition to the application plug-ins, all PRE commands, POST commands, and APP commands can be executed remotely through the agent. This provides the ability to mount file systems or to perform additional application processing remotely. The agent has an access file under `/path/so/scAgent_v<#>/config/agent.conf` where certain commands are allowed to run. By default, all commands are denied. This means that only the built-in or community plug-ins

can execute commands through the agent. PRE or POST scripting commands or scripts must be allowed in `agent.conf`.

The following illustration shows the Snap Creator Agent communication:
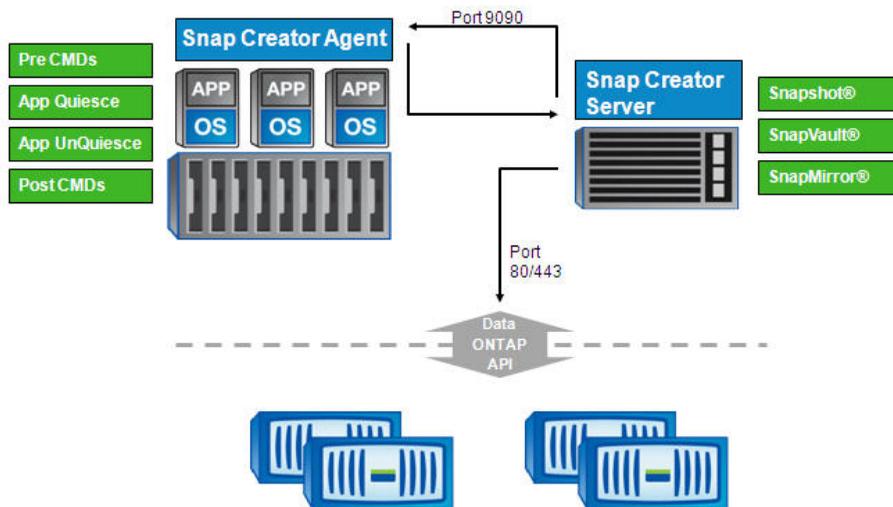
Snap Creator Agent Multithreading

The Snap Creator Agent can handle parallel requests by allowing the Snap Creator Agent to distribute requests coming from the agent itself.

The following illustration shows the different types of deployment:
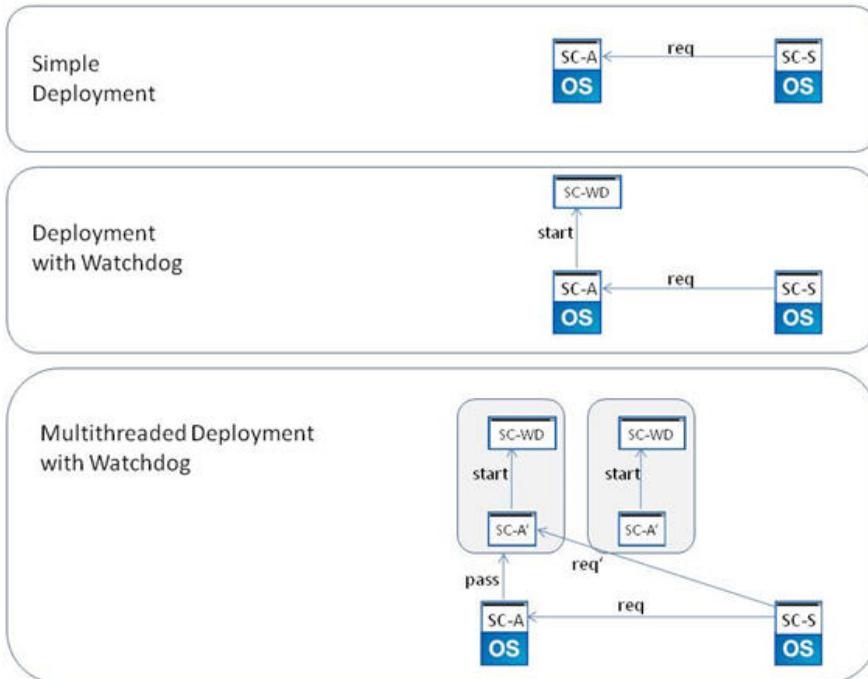
Simple deployment

In simple deployment, the Snap Creator Server opens a connection to the Snap Creator Agent and sends the requests. Unless the Snap Creator Server stops, the connection is open and the agent is blocked from accepting further requests.

Deployment using a watchdog

After accepting the Snap Creator request to quiesce the database, the Snap Creator Agent creates a separate process (watchdog). This watchdog inherits the environment and all the settings of the parent process and unquiesces the database after a configured timeout.

In this scenario, the agent is blocked until the Snap Creator Server stops or explicitly closes the connection.

Multithreaded deployment using a watchdog

In the intended multithreaded deployment, the Snap Creator Agent immediately creates an additional process (SC-A') and passes the "communication responsibility" (req') to this process. This newly created process inherits the basic Snap Creator Agent settings. The Snap Creator Server communicates with this process. If configured, this process creates a watchdog when the quiesce operation is called.

After the additional process is created, the Snap Creator Agent is able to accept additional requests.

Note: The Multithreaded agent is not supported on Windows.

Preparing to install Snap Creator

Before installing Snap Creator, you must perform certain tasks, such as downloading the Snap Creator software, creating a Data ONTAP user, and installing Java on Snap Creator.

Downloading Snap Creator software

You can download the Snap Creator software from the N series support website (accessed and navigated as described in *Websites* on page 7).

Creating a Data ONTAP user

Snap Creator uses the Data ONTAP API to communicate with the storage system. Therefore, it is required to create a new role, group, and user. The role is assigned to the group and the group contains the user.

About this task

These tasks must be completed using the Data ONTAP CLI (SSH, console connection, or telnet).

> **Note:** Copy and paste the given commands into a text editor and verify before pasting it in the CLI console.

Steps

1. Create a role defining the rights required for Snap Creator on the storage system by entering the following command:

   ```
   useradmin role add rolename -a login-*,api-snapshot-*, api-system-*,api-
   ems-*,api-snapvault-*,api-snapmirror-*, api-volume-*,api-lun-*,api-cg-
   *,api-nfs-*,api-file-*, api-license-*, api-net-*
   ```

2. Create a new group on the storage system and assign the previously created role to the group by entering the following command:

   ```
   useradmin group add groupname -r rolename
   ```

3. Create a user account in the previously created group that will be used for Snap Creator by entering the following command:

   ```
   useradmin user add username -g groupname
   ```

4. Enter the password for the account.

   > **Note:** These steps must be repeated for each controller where Snap Creator is used.

Installing Java on Snap Creator Server

For the Snap Creator GUI to function, Java must be installed on the Snap Creator Server. The Snap Creator GUI is Java based and uses the N series Web Framework. Java Runtime Environment (JRE) 1.6 or higher must be installed on the Snap Creator Server.

Steps

1. Download Java from the Java website.

   Note: The version of Java installed must match the version of Snap Creator installed.

2. Verify the version of java by entering the following command: `java -version`

   Example

   ```
   C:\Documents and Settings\Administrator>java -version
   java version "1.7.0_04-ea"
   Java(TM) SE Runtime Environment (build 1.7.0_04-ea-b01)
   Java HotSpot(TM) Client VM (build 23.0-b03, mixed mode, sharing)
   ```

   The output of the command lists the installed version of Java. If the Java installation is 64-bit that will be listed. If there is no mention of the bit-level, then the installation is 32-bit.

Pre-installation steps for Domino plug-in

The Domino plug-in is included as part of the Snap Creator installation. There are a few pre-installation steps to be performed depending on the operating system used.

Linux/Solaris/AIX specific settings

Lotus Domino for Linux is available only as a 32-bit application, so regardless of the server bit-level, the 32-bit version of Snap Creator must be used to support Lotus Domino.

Domino on Linux and Solaris cannot be run as root. As a result Snap Creator, Snap Creator Server, Agent, and GUI cannot be run as root. It is recommended that Snap Creator is run using the same account that was used to install Domino.

For the Domino plug-in to work properly, there are a series of symbolic links that must be created. These three symbolic links (symlinks) must be made to Domino's shared object files for the plug-in to work properly. After installing Domino to the default location, you can copy and paste the following commands into the environment:

```
ln -s /opt/ibm/lotus/notes/latest/linux/libxmlproc.so /usr/lib/
libxmlproc.so

ln -s /opt/ibm/lotus/notes/latest/linux/libndgts.so /usr/lib/libndgts.so
```

```
ln -s /opt/ibm/lotus/notes/latest/linux/libnotes.so /usr/lib/libnotes.so
```

Pre-installation steps for Domino plug-in on Windows

The path to the Domino binary files must be added into the Environmental Variables for Windows. This path should be the same as `Notes_ExecDirectory` listed in the Domino options table.

About this task

Note: If you perform these steps after Snap Creator is installed, you must restart the Snap Creator service(s).

Steps

1. Right-click **My Computer** and select **Properties** (If My Computer is not on the Desktop, it can usually be found in the Start menu).

2. Click the **Advanced** tab in Windows 2003 or the **Advanced system settings** task in Windows 2008.

3. Click **Environmental Variables**.

4. Use a system variable. There are two sections: **User variables** and **System variables**. With a user variable, the Snap Creator service must be run as that particular user.

5. Locate and select **PATH**, then click **Edit**.

6. Append `;` after the last value, and then add the Domino path.

7. Click **OK** on each window until you exit to the Desktop.

Installing Snap Creator on Windows

You can install Snap Creator Server and Snap Creator Agent on Windows using the Windows installer.

Steps

1. Extract the .exe file to C:\.

2. Run the install package executable and proceed through the installation wizard.

   If you want to enable job monitoring, select the **Enable Job monitor** checkbox. The Job monitor size should be between 1 and 1000.

   Note: Do not close any window until the installation is complete.

Related tasks

Installing Snap Creator on UNIX

Snap Creator installation for UNIX differs from Windows in that the software package is an executable that when extracted contains both the Snap Creator Server and the Snap Creator Agent.

UNIX Services (agent/server) feature offers a start script for the Snap Creator Agent and Snap Creator Server. The start scripts are written in UNIX shell script (bourne shell) and are designed to run on all UNIX environments supported by Snap Creator.

Installing Snap Creator Server

You can install Snap Creator Server on UNIX. The Snap Creator Server is designed to run on any open systems platform.

Steps

1. Extract the `.tgz` file to `/usr/local`. Change directory to the Snap Creator Server root directory `/path/to/scServer_v<#>`.

2. Run Snap Creator setup by entering the following command:

   `./snapcreator --profile setup.`

   Note: The Snap Creator executable should already be configured upon extraction with the proper permissions to be executed. If profile setup command does not work, the permissions must be added by running following command: `chmod 755 snapcreator`

3. Accept the EULA license agreement.

4. Optional: Enter the serial number of the storage system that will be used with Snap Creator.

   Note: The intent is to add the controller serial number applicable to the Snap Creator application. The Snap Creator application archives this information for later use. The user can run `-version` command to retrieve this serial number information when contacting technical support to open a Snap Creator case.

5. To enable GUI job monitoring, enter

   `Y`

6. Enter the job monitor size.

   Note: The Job monitor size should be between 1 and 1000.

7. Enter the user name and password for the administrative user for the GUI.

8. Start the Snap Creator GUI by following the instructions provided on the screen.

9. To start Snap Creator GUI, type the following URL in the web browser: http://
   <*HostName*>:<*Port*> where:

   • *HostName* is the host name or IP address of the Snap Creator Server
   • *Port* is the port number where the Snap Creator Server is running. By default, this is port
     8080.

Related tasks

Installing Snap Creator Agent

The Snap Creator Agent is designed to run on any open systems platform. If the agent is not required,
you can choose to run the Snap Creator Server on the application server locally.

Steps

1. Extract the .tgz file to /usr/local.

2. Change directory to the Snap Creator Server root directory /path/to/scAgent_v<#>.

3. Run Snap Creator setup by entering the following command:

   ./snapcreator --profile setup

   Snap Creator Agent setup on UNIX configures the /path/to/scAgent_v<#>/xscript and
   prints usage information.

4. Install the agent.

   The Snap Creator Agent has the ability to run as a daemon under UNIX. The agent uses either the
   default port 9090 or a user-specified port. To set a non-default port number, configure the
   following environment variable: SC_AGENT_PORT.

   If the SC_AGENT_PORT environment variable is not set, then the agent defaults to port 9090.

   To ensure that the agent starts when rebooting, a start script must be set up under /path/to/
   rc2.d. Start scripts must begin with S9x (S99scagent). The start script should contain the
   following:

   • /path/to/scAgent_v<#>/bin/scAgent start
     This command is run to start the agent manually.
   • /path/to/scAgent_v<#>/bin/scAgent stop
     This command is run to stop the agent manually.
   • /path/to/scAgent_v<#>/bin/scAgent status

This command is run to query the agent status.

Uninstalling Snap Creator from Windows

You can uninstall Snap Creator from the Windows start menu.

Before you begin

- You must have backed up the log and configuration files to retain the existing configuration.
- If the server is manually started from the console, you must have stopped it.

Step

1. Select **All programs > Snap Creator > Uninstall IBM N series Snap Creator Framework**.

Information required to configure Snap Creator

Snap Creator 3.5.0 supports Oracle, MySQL, DB2, VMware, Sybase ASE, Domino, MaxDB, SnapManager for SQL Server, and SnapManager for Exchange plug-ins. Community plug-ins are not included in the package and must be downloaded separately.

The following table lists the plug-in parameters, settings, and the description:

Parameters	Setting	Description
APP_NAME	oracle, db2, mysql, vibe, sybase, domino, smsql, sme, maxdb <plug-in>	Determines which application is being backed up. Snap Creator has built-in support for the listed applications. You can either use APP_NAME or configure APP_QUIESCE_CMDXX, APP_UNQUIESCE_CMDXX, and PRE_EXIT_CMDXX. If the application is not directly supported in Snap Creator, you can use a plug-in or run your own application quiesce/ unquiesce commands or scripts. <PLUG-IN>: Copy the plug-in to the /path/to/scServer| scAgent/plug-ins directory and specify the plug-in in the APP_NAME parameter. Commands or Scripts: APP_QUIESCE_CMD01=/ path/to/quiesceCMD APP_UNQUIESCE_CMD01=/ path/to/unquiesceCMD PRE_EXIT_CMD01=/ path/to/unquiesceCMD

Parameters	Setting	Description
APP_IGNORE_ERROR	(Y|N)	Determines if Snap Creator should ignore errors from application plug-ins. This is useful when the user wants to back up multiple databases and does not want to stop the backup based on quiesce or unquiesce of single database failing.
APP_DEFINED_RESTORE	(Y|N)	Enables application based restores. In the event of a restore, Snap Creator sends a request to the application plug-in and the plug-in handles the request.
APP_AUTO_DISCOVERY	(Y|N)	Enables application auto discovery. Snap Creator sends discover request to application plug-in and the plug-in is then responsible for the discovery of the storage configuration. This can be done dynamically or persistent with the APP_CONF_PERSISTENCE parameter if information is to be saved to the config file. This parameter is similar to VALIDATE_VOLUMES but allows one through plug-in framework to add discover functionality to any application plug-in.
APP_CONF_PERSISTENCY	(Y|N)	Enables auto discovery to be persistent, which means changes are dynamically updated in config file.

Parameters	Setting	Description
VALIDATE_VOLUMES	DATA	Snap Creator validates that all volumes where the database resides are part of the backup. Currently, there are some limitations. Only NFS is supported. Currently, this option checks data files only for the supported databases.
FS_NAME	<plug-in>	Determines which plug-in is being used for file system operations.
META_DATA_VOLUME		Allows for Snapshot copy of specified volume to occur after unquiesce. This can be valuable for certain plug-ins where Snapshot copy of data must be taken at different times. The meta data volume must not be only volume specified: controller1:volume1
APP_DEFINED_CLONE	(Y|N)	The built-in cloning abilities of Snap Creator will be ignored. Instead the plug-in is responsible for handling all clone activities including vol or LUN clone creation and deletion. The built-in plug-ins do not this override type of clone.
JAVA_HOME	Text	Setting which points to the Java Virtual Machine which should be used for executing .class and .jar files. If set, `$JAVA_HOME/bin/java` will be used, otherwise just java to run the `.class/.jar file #`

Parameters	Setting	Description
JVM_ARGS	Text	Setting to control the Java Virtual Machine when executing native Java .class or `.jar` files. The default setting is -Xms32M - Xmx128M
JAVA_CLASSPATH	Text	Setting which defines the Java classpath. Per default, `plug-ins/native` is configured and can be completed with this environment variable, which will be appended to the default.
PERL_HOME	Text	Setting which points to the Perl interpreter which should be used for executing `.pl` files. If set, `$PERL_HOME/bin/perl` will be used, otherwise just perl to run the `.pl` file
PERL_OPTS	Text	Setting to control the Perl interpreter when executing native Perl files. Options for additional settings include directories (-I) that can be passed to the Perl interpreter.
PYTHON_HOME	Text	Setting which points to the Python interpreter which should be used for executing `.py` files. If set, `$PYTHON_HOME/python` will be used, otherwise just python to run the `.py` file.
PYTHON_OPTS	Text	Setting to control the Python interpreter when executing native Python files.

Oracle plug-in

The Oracle plug-in supports only Oracle 10g database or higher. The Oracle plug-in uses SQL*Plus to communicate with the database.

The following table lists the Oracle plug-in parameters, the settings, and the description:

Parameter	Settings	Description
APP_NAME	oracle	The application name
ORACLE_DATABASES		A list of Oracle databases and the user name, that is, db1:user1;db2:user2.
SQLPLUS_CMD		The path to the sqlplus command.
CNTL_FILE_BACKUP_DIR		The path to the directory where the user should store backup control files (Oracle user must have permissions).
ORA_TEMP		The path to a directory to store temp file, that is, /tmp (Oracle user must have permissions).
ARCHIVE_LOG_ONLY	(Y|N)	Informs Oracle Plug-in to only perform a switch log. This setting is useful if you are handling archive logs separate from data backup.
ORACLE_HOME		The path to the oracle home directory
ORACLE_HOME_<SID>		PATH to Oracle home directory for a given SID. When backing up multiple databases it might be important to specify more than one Oracle home.

Parameter	Settings	Description
ORACLE_EXPORT_PARAMETERS	(Y|N)	The ORACLE_HOME and ORACLE_SID environment parameters are exported using the export command. This is applicable only in UNIX or Linux based environment.

MySQL plug-in

The MySQL plug-in supports MySQL 5.x. The MySQL plug-in uses Net-MySQL to communicate with the database.

The following table lists the MySQL plug-in parameters, the settings, and the description:

Parameter	Settings	Description
APP_NAME	mysql	The application name
MYSQL_DATABASES		A list of MySQL database(s) and the user name/password that is, db1:user1/pwd1;db2:user2/pwd2
HOST		Name of the host where the databases are located: localhost
PORTS	(Y|N)	A list of database(s) and the ports they are listening on, that is, db1:3307;db2:3308
MASTER_SLAVE		Specifies the database(s) to be part of the MASTER/SLAVE environment.

DB2 plug-in

The DB2 plug-in supports DB2 9.x. The DB2 plug-in uses the db2 command to communicate with the database.

The following table lists the DB2 plug-in parameters, the settings, and the description:

Parameter	Settings	Description
APP_NAME	db2	The application name

Parameter	Settings	Description
DB2_DATABASES		A list of db2 database(s) and the user name, that is, db1:user1;db2:user2
DB2_CMD		The path used by the db2 command to interact with the database. **Note:** For Windows, you must first give a path to `db2cmd.exe` For example UNIX:DB2_CMD=`/ibm/sqllib/bin/db2` Windows: DB2_CMD= `z:\IBM\SQLLIB\BIN\db2cmd.exe -c -w -i Z:\IBM\SQLLIB\BIN\db2.exe`

VMware (VIBE) plug-in

Snap Creator supports backup of VMware VMs and vApps through the VMware plug-in. The VMware plug-in is an integrated plug-in for both VMs with vSphere and vApps with vCloud.

Snap Creator 3.5.0 supports VMware vSphere 4.x, 5 and VMware vCloud Director 1.0, 1.5.

Consider the following when you use the VMware plug-in:

- The VMware plug-in is supported only on Windows and Linux. If you are using a non-Windows or non-Linux Snap Creator Server, you need a Snap Creator Windows/Linux agent to run the VMware plug-in.
- VMware HA with VMware plug-in is not tested and is not supported.
- Consistency group Snapshot copies with VMware plug-in is not tested and is not supported.
- The VMware plug-in does not support Raw Device Mapping.
- After restore operations are complete, you must run a Snap Creator backup of the restored VMs and vApps to ensure that the new environment is cleaned up appropriately and all VMware Snapshot copies are removed.
- If the plug-in is not able to clean up VMware Snapshot copies and displays an error, you must remove the VMware Snapshot copies manually. The VMware Plug-in does not guarantee 100% VMware Snapshot copy removal and it is a known VMware issue.
- The VMware plug-in supports only 32-bit Snap Creator with 32-bit Linux system and 64-bit Snap Creator with 64-bit Linux system.

The following table lists the VMware plug-in parameters and the description:

Parameter	Description
VIBE_VCLOUD_IPADDR	IP addresses or hostname(s) of the vCloud Director to log in to (vCloud ONLY)
VIBE_VCLOUD_USER	User name to log in to the vCloud Director (vCloud ONLY). You must set @<org> or @system (top-level vCloud database). Example: VIBE_VCLOUD_USER=administrator@system **Note:** Only a vCloud Director system administrator can perform backup and restore operations. Backup or restore operations fail if performed by any other user.
VIBE_VCLOUD_PASSWD	Password associated with the specified VCLOUD_USER (vCloud ONLY)
VIBE_VCENTER_USER	User name to log in to vCenter
VIBE_VCENTER_PASSWD	Password associated with the specified VCENTER_USER
VIBE_VCLOUD_NAMES	List of Organization, vDC and vApp object names to back up (vCloud ONLY) Example: VIBE_VCLOUD_NAMES=ORG:VDC1,VDC2:VAPP1,VAPP2;ORG2:VDC3:;ORG3::VAPP6
VIBE_VSPHERE_NAMES	List of Data stores and VMs to back up per vCenter (vSphere ONLY) Example: VIBE_VSPHERE_NAMES=VCENTER1:DS1:VM1;VCENTER2;DS2,DS3:;VCENTER3::VM4
VIBE_TRIM_VSPHERE_NAMES	List of VMs to remove from backup per vCenter (vSphere ONLY) Example: VIBE_TRIM_VSPHERE_NAMES=VCENTER1:VM99;VCENTER2:VM5,VM12
VIBE_RESTORE_INTERVAL	Time between each restore check (default: 30 seconds)
VIBE_RESTORE_TIME	Total time to wait for complete restore (default: 3600 seconds)

Parameter	Description
VIBE_VMWARE_SNAPSHOT	Take a VMware Snapshot copy during backup (default: Y)
VIBE_NOPING	Do not ICMP ping VMware or storage controllers (default: N)
VIBE_DYNAMIC_VOLUMES_UPDATE	If set to 'N', does not perform dynamic volume update. You have to set VOLUMES, SNAPVAULT_VOLUMES, SNAPMIRROR_VOLUMES and NTAP_DFM_DATA_SET manually (default: not set)

vCloud vApp backup and restore using VMware plug-in

Snap Creator 3.5.0 supports backup of vCloud vApps through the VMware plug-in. vApp/VM backups are taken by this plug-in through the vCloud Director (vCD) API and vSphere API, which are invoked on the VMware vCloud Director and VMware vCenter server, respectively.

For vApp backup or restore, you must provide the following details in the configuration file:

- vCloud IP and credentials
- vCloud Organizations, vDCs and vApp names

Note: If more than one vCenter is attached to vCloud, then the password for the all vCenters should be same.

Consider the following for vCloud backup and restore processes:

- The backup and restore processes for both VMware and vCloud are very similar except the discovery process, where vCloud backups require additional discovery of the vCloud Director (vCD) metadata using REST APIs.
- You should provide details of the vCloud with the organizations, vDCs, or vApps to be backed up.
- If a vDC is listed, all the vApps in the vDC are backed up.
- The vCloud module discovers VMs associated with any vApp that needs to be backed up and puts them on a backup list.
- If a vApp selected for backup is contained within an Organization or vDC also selected for backup, it will be backed up only once.

Note: For Virtual Machine File System (VMFS) restore operations through the VMware plug-in, there must be enough space in the volume to create a LUN clone that is equal to the size of the LUN.

Note: You must close and reopen the configuration file in the GUI before running restore on a VMware configuration, because volumes discovered are not updated automatically.

VM backup and restore using VMware plug-in

Snap Creator supports backup of VMware VMs through VMware plug-in. VM backups are taken through the vSphere API which are invoked on the VMware vCenter server.

For VM backup, the user must specify the following details in the configuration file:

- vCenter IP/hostname and credentials
- vSphere VM(s) and datastore names

For restore operations, you should provide the backup parameters and the Snapshot copy name to be used for the restore.

Consider the following points for VMware backup and restore:

- If a VM is listed and is not available, the plug-in displays an error message. It will not be able to restore a lost VM even if it is backed up.
- If a Datastore is listed, all the VMs in the Datastore will be backed up.
- Only the listed VMs or VMs located on the Datastores specified will be backed up.
- If a VM selected for backup is contained within a Datastore that is also selected for backup, it will be backed up only once.
- This plug-in supports both NFS and VMFS Datastores.
- VM restores on an NFS Datastore use a Single File SnapRestore (SFSR) on the storage system, which avoids host copies.
- To restore VM on a VMFS Datastore, perform the following steps:

  1. Use FlexClone or LUN clone of the LUN contained in a specific restore Snapshot copy.

  2. Map that to the cluster.

  3. Use vCenter API calls to copy contents from the Snapshot VMFS datastore to the original VMFS datastore.

Sybase plug-in

The Sybase plug-in uses the `isql` command to interact with the Sybase database. The Sybase plug-in can quiesce one or more databases. The Sybase ASE plug-in supports Sybase ASE 12.5.x, Sybase ASE 15.0.x, and Sybase ASE 15.5.

The following table lists the Sybase plug-in parameters, the settings, and the description:

Parameter	Setting	Description
SYBASE_SERVER		The Sybase data server name (–S option on isql) Example: SYBASE_SERVER=p_test

Parameter	Setting	Description
SYBASE_DATABASES		The list of databases within the instance to back up. Format is DB1:USER:PASSWD;DB2:USER:PASSWD. The master database is added. If a database named "+ALL" is used, then database autodiscovery is used and the sybsyntax, sybsystemdb, sybsystemprocs and tempdb databases are excluded. Encrypted passwords are supported if NTAP_PWD_PROTECTION is set. Example: SYBASE_DATABASES=DBAtest2:sa/ 53616c7465645f5f76881b465c a8ce3745c239b60e04351e Example: SYBASE_DATABASES= +ALL:sa/ 53616c7465645f5f76881b465c a8ce3745c239b60e04351e
SYBASE_DATABASES_EXCLUDE	(Y|N)	Allows databases to be excluded if the +ALL construct is used, use ';' to allow multiple databases. Example: SYBASE_DATABASES_EXCLUDE=pubs2;test_db1.
SYBASE_TRAN_DUMP		Allows post Snapshot Sybase transaction dump to be performed. Each database requiring a txn dump needs to be specified. Format is "DB1:PATH;DB2:PATH" where path is a directory. Example: SYBASE_TRAN_DUMP=pubs2:/sybasedumps/pubs2

Parameter	Setting	Description
SYBASE_TRAN_DUMP_FORMAT		Allows the user to specify the dump naming convention. Three "keys" can be specified, %S = Instance name from SYBASE_SERVER %D is database from SYBASE_DATABASES and %T is a unique timestamp. Default format is %S_%D_%T.cmn Example: SYBASE_TRAN_DUMP_FORMAT=%S_%D_%T.log
SYBASE_TRAN_DUMP_COMPRESS		Allows native Sybase transaction dump compression to be enabled. Example: SYBASE_TRAN_DUMP_COMPRESS=Y
SYBASE_ISQL_CMD		Defines the path to the "isql" command to be used. Example: SYBASE_ISQL_CMD=/opt/sybase/OCS-15_0/bin/isql
SYBASE		The location of the Sybase install. Example: SYBASE=/sybase
SYBASE_LOGDIR		Defines the directory where Snap Creator logs are placed. Example: SYBASE_LOGDIR=/usr/local/ntap/scServer3.3.0/logs
SYBASE_MANIFEST		Specifies the databases for which the manifest file should be created along with the location where the manifest file should be placed. Example: SYBASE_MANIFEST=DBAtest2:/t_inf_nzl_devs/

Parameter	Setting	Description
SYBASE_MANIFEST_FORMAT		Allows the user to specify the manifest file naming convention. Three "keys" can be specified: %S = Instance name from SYBASE_SERVER, %D is database from SYBASE_DATABASES, and %T is a unique timestamp which is the same as used for Snapshot naming. Default format is %S_%D_%T.manifest Example: SYBASE_MANIFEST_FORMAT=%S_%D_%T.manifest
SYBASE_MANIFEST_DELETE	(Y|N)	Allows the manifest to be deleted once the Snapshot has been performed. The manifest file should be captured within the Snapshot so it is always available with the backup. Example: SYBASE_MANIFEST_DELETE=Y

MaxDB plug-in

The MaxDB plug-in supports MaxDB 7.8.

The following table lists the MaxDB plug-in parameters, the settings, and the description:

Parameter	Setting	Description
APP_NAME	maxdb	The application name
XUSER_ENABLE	(Y|N)	Enables the use of an xuser for maxdb so password is not required for db user
HANDLE_LOGWRITER	(Y|N)	Executes suspend logwriter/ resume logwriter if set to Y

Parameter	Setting	Description
DBMCLICMD		The path to the MaxDB dbmcli command, if not set dbmcli on the search path is used
SQLCLICMD		The path to the MaxDB sqlcli command, if not set sqlcli on the search path is used
MAXDB_UPDATE_HIST_LOG	(Y|N)	Tells the maxdb backup program if it should update maxdb history log
MAXDB_DATABASES		List of database(s) and their username/password separated by a comma of which you want to backup Example: MAXDB_DATABASES=db1: user1/password;db2:user2/ password
MAXDB_CHECK_SNAPSHOT_DIR		Setting to check, if a Snap Creator Snapshot copy operation was successful and the Snapshot copy has been taken. NFS only. Directory must point to the directory which contains the `.snapshot` directory. Multiple directories can be specified as a comma separated list Multiple databases can be specified as a semicolon separated list In case of MaxDB 7.8 and newer, the database backup request will be marked as Failed in the backup history. The shown error code identifies the number of missing snapshots. Example: MAXDB_CHECK_SNAPSHOT_DIR=SID:directory[,directory...] [SID2:directory[,directory...]

Lotus Domino plug-in

The Lotus Domino plug-in supports Lotus Domino 8.0, Lotus Domino 8.0.x, Lotus Domino 8.5, and Lotus Domino 8.5.x.

The IBM Lotus Domino application consistency feature ensures application consistency by interfacing with the Domino APIs through the Domino plug-in. This plug-in is supported on Windows, Linux, AIX, and Solaris.

The Domino plug-in collects a list of all databases, templates, and mailboxes in the Domino environment. Each file is then placed in a quiesced state. When the databases are quiesced, all changes to the databases are stored in a temporary area known as change info. When the Snapshot copy is taken, the quiesce is released and the change info is written back to the database.

The change info must be stored on a volume that is not a part of the Snapshot copy. The change info is also written back to a database after a restore. The DOMINO_RESTORE_DATA_PATH must be set to the path where the Domino data is being restored –this path might change depending on the type of the restore being performed. A volume restore must be set to the same path as the Domino data, while a single database restore is set to an alternate path on the same volume as the Domino data. If the DOMINO_RESTORE_DATA_PATH is not set properly, the change info is not applied to the database which can result in some data loss.

A new log folder is created under DOMINO_CHANGE_INFO_PATH. All the archived logs are stored under this folder. To delete the archived logs, enable archive log options.

Example:

```
ARCHIVE_LOG_ENABLE=Y
ARCHIVE_LOG_DIR=/home/domino/changeinfo/logs
ARCHIVE_LOG_RETENTION=30
ARCHIVE_LOG_EXT=TXN
```

If any database is corrupt, then the Domino plug-in continues with the backup of the remaining databases if APP_IGNORE_ERROR option is enabled. This is useful in a scenario where the user wants to back up multiple databases and does not want to stop the backup based on quiesce or unquiesce of single database failing.

The following table lists the Domino plug-in parameters, the settings, and the description:

Parameter	Setting	Description
DOMINO_DATA_PATH		Path to Domino Data directory. Example: `/notes/notesdata`
DOMINO_INI_PATH		Path to notes.ini file (include notes.ini in path) Example: `/notes/notesdata/notes.ini`

Parameter	Setting	Description
DOMINO_CHANGE_INFO_PATH		Path where change info files should be saved. Use a different volume than Domino Data or Log paths. Change info should not be captured in the same Snapshot copy. Example:`/notes/changeinfo` **Note:** To delete the old change info files, enable archive log option
DOMINO_DATABASE_TYPE		Can be any of the following values: 0 = Backup everything (1+2+3 below) 1 = Backup only for *.BOX files 2 = Backup only for *.NSF, *.NSG and NSH files. 3 = Backup only for *.NTF files.
LOTUS		Path where Domino is installed. Example: `/opt/ibm/lotus`
Notes_ExecDirectory		Path that contains Domino shared object (.so or .dll) files. Example: `/opt/ibm/lotus/notes/latest/linux/`
DOMINO_RESTORE_DATA_PATH		The Domino plug-in applies change information to databases after a restore. In order to do this properly, this parameter must be set to the location where Domino Data is being restored. Use the same path as DOMINO_DATA_PATH if restoring to the same location. If performing a single file restore, provide the path where you are restoring your databases. Example: `/notes/notesdata`

SnapManager for Microsoft Exchange plug-in

The SnapManager for Microsoft Exchange plug-in supports SnapManager 6.0 with Microsoft Exchange Server 2007 and Microsoft Exchange Server 2010.

Note: The SnapManager for Microsoft Exchange plug-in requires Snap Creator Agent to be installed.

Note: The SnapManager for Microsoft Exchange plug-in is not supported with Data ONTAP 8.1 Cluster-Mode.

The following table lists the SnapManager for Microsoft Exchange plug-in parameters, the settings, and the description:

Parameter	Setting	Description
SME_PS_CONF		Path to the PowerShell configuration file for the SnapManager for Microsoft Exchange. Example: SME_PS_CONF=C:\Program Files\IBM\SnapManager for Exchange\smeShell.psc1
SME_BACKUP_OPTIONS		SnapManager for Microsoft Exchange backup options. Snap Creator uses a PowerShell cmdlet for new-backup. Example: SME_BACKUP_OPTIONS=-Server 'EX2K10-DAG01' -GenericNaming -ManagementGroup 'Standard' -NoTruncateLogs $False -RetainBackups 8 -StorageGroup 'dag01_db01' -BackupCopyRemoteCCRNode $False
SME_SERVER_NAME		SnapManager for Microsoft Exchange server name
SME_32bit	(Y|N)	Setting to enable use of 32-bit version of PowerShell

SnapManager for Microsoft SQL Server plug-in

The SnapManager for Microsoft SQL Server plug-in supports SnapManager 6.0 with Microsoft SQL Server 2007 and Microsoft SQL Server 2008.

Note: The SnapManager for Microsoft SQL Server plug-in requires Snap Creator Agent to be installed.

Note: The SnapManager for Microsoft SQL Server plug-in is not supported with Data ONTAP 8.1 Cluster-Mode.

The following table lists the SnapManager for Microsoft SQL Server plug-in parameters, the settings, and the description:

Parameter	Setting	Description
SMSQL_PS_CONF		Path to the PowerShell configuration file for the SnapManager for Microsoft SQL Server. Example: SMSQL_PS_CONF=C: \Program Files\IBM \SnapManager for SQL Server\smsqlShell.psc1
SMSQL_BACKUP_OPTIONS		SnapManager for Microsoft SQL Server backup options. Snap Creator uses a PowerShell cmdlet for new-backup. Example: SMSQL_BACKUP_OPTIONS =-svr 'SQL' -d 'SQL \SHAREPOINT', '1', 'WSS_Content' -RetainBackups 7 -lb -bksif - RetainSnapofSnapInfo 8 -trlog -gen -mgmt standard
SMSQL_SERVER_NAME		SnapManager for Microsoft SQL Server name
SMSQL_32bit	(Y|N)	Setting to enable use of 32-bit version of PowerShell

Archive log plug-in

The Archive log plug-in works for any database. This plug-in does not communicate with the database. It deletes archive logs that are older than the configured threshold value (in days).

The following table lists the Archive log parameters, the settings and the description:

Parameter	Setting	Description
ARCHIVE_LOG_ENABLE	(Y|N)	Enables archive log management (deletion of old archive logs).
ARCHIVE_LOG_RETENTION		Numbers of days the archive logs are retained. Epoch time is used and is precise to the second.
ARCHIVE_LOG_DIR		Path to the directory that contains the archive logs. Optionally, for multiple archive log directories, ARCHIVE_LOG_DIR<##> can be used.
ARCHIVE_LOG_EXT		File extension of the archive logs, that is, if the archive logs are 10192091019.log, you would set this to "log"; the search pattern used is: <something>.<extension>
ARCHIVE_LOG_RECURSIVE_SEARCH		Setting allows management of archive logs within sub directories. If archive logs are located under sub directories, this option should be used.

Configuring Snap Creator Server

The Snap Creator configuration file is located in /path/to/scServer_v<#>/configs/
<profile>/<config>.conf. You can create multiple configurations, but Snap Creator Server runs
only one configuration at a time.

You can edit this file by using Visual Interactive (VI) (UNIX) or any text editor in Windows.
Additionally, you can use the Snap Creator GUI to edit and manage configuration files.

Creating a configuration file using CLI

You can create a new directory or profile for your configuration under /path/to/
scServer_v<#>/configs. It is a best practice to name it after the host or application that is backed
up.

About this task

This example uses the name oraprod01. The default template is located in /path/to/
scServer_v<#>/configs/default/default.conf.

Steps

1. Create the following directory:

   mkdir /path/to/scServer_v<#>/configs/oraprod01

2. Copy or rename the following default template to your new configuration directory:

   cp /path/to/scServer_v<#>/configs/default/default.conf

   /path/to/scServer_v<#>/configs/oraprod01/oraprod01.conf

3. Edit your configuration file by using VI (UNIX) or any text editor in Windows.

Creating a configuration file using GUI

You can create a configuration file using the GUI.

Steps

1. Open the web browser to the following URL: http://myserver.mydomain.com:8080 and login.

2. In the **Management Configurations** screen, click Add backup profile and enter the new
   profile name.

The profile name should relate to the application being backed up. Adding a profile creates a directory under the`/path/to/scServer_v<#>/configs` directory.

The new backup profile is created.

3.
Right click the backup profile and select ⊕ **New Configuration**.

4. Proceed through the configuration wizard.

5. Review the summary and click **Finish**.

> **Note:** You can view configuration files listed under the profile. It contains all the configuration specific details. You can rename and delete a configuration by right-clicking and selecting **Delete** or **Rename**. The GUI creates the same configuration files you would create by using the CLI. You can update and edit configuration files created by the GUI from the CLI or from the CLI to the GUI.

Referencing

Referencing is the ability to define variables within the configuration file. The configuration file is dynamic, which means that you can create and set variables within the configuration itself.

This is done by using the `%` character. For example, use of SnapDrive instead of Data ONTAP API to create the Snapshot copies. As the Snapshot copy names need to be unique, you must set a dynamic variable. The following is an example from a Windows SnapDrive configuration:

```
NTAP_SNAPSHOT_CREATE_CMD1="c:/Program Files/IBM/SnapDrive/sdcli" snap
create -m fx1b4 -s %SNAME-%SNAP_TYPE_%SNAP_TIME-D E:
```

or

```
NTAP_SNAPSHOT_CREATE_CMD1="c:/Program Files/IBM/SnapDrive/sdcli" snap
create -m fx1b4 -s %SNAME-%SNAP_TYPE_recent -D E:
```

The following table lists the built-in variables that can be referenced:

Variables	Description
%SNAP_TYPE	This is given when you run Snap Creator and it is your retention policy, that is, daily, weekly, monthly.
%SNAP_TIME	This is a timestamp (YYYYMMDDhhmmss) used in the naming of Snapshot copies to create a guaranteed unique name for every Snapshot copy. It is also used to name the backup reports and Sybase transaction logs.

Variables	Description
%ACTION	This is the given action when you run Snap Creator: (snap|clone_vol|clone_lun| arch|restore|delete|snaplist| clonelist|pmsetup|ossv)
%MSG	This is used to send an error message to another program such as e-mail or Tivoli. It can only be used with the SENDTRAP function.
%USER_DEFINED	This passes a user-defined argument to the Snap Creator configuration file. For example, To integrate with a backup application like NetBackup, CommVault, or Legato NetWorker you might have to pass the desired backup product's schedule into the configuration file when you have multiple schedules and want to call NetBackup, CommVault, or Legato NetWorker with a certain schedule. You could also achieve this by having multiple configuration files for the different scenarios.

The following table lists the parameters required in a basic configuration:

Parameter	Setting	Description
SNAME (REQUIRED)		Snapshot copy naming convention should be unique. Snapshot copies are deleted according to the naming convention and retention policy used.
SNAP_TIMESTAMP_ ONLY (REQUIRED)	(Y|N)	If set to Y, Snapshot copies end with YYYYMMDDHHMMSS. Otherwise, new Snapshot copies are renamed to end with YYYYMMDDHHMMSS.
VOLUMES (REQUIRED)		List of primary storage controllers and volumes you want to create a Snapshot copy of, that is, controller1:vol1,vol2,vol3; controller2:vol1;controller3:vol 2,vol3.

Parameter	Setting	Description
NTAP_SNAPSHOT_ RETENTIONS (REQUIRED)		Determines the number of Snapshot copies you want to retain for a given policy, that is, daily:7,weekly:4,monthly:1.
NTAP_USERS (REQUIRED)		This is the list of appliances and their corresponding user names/passwords, that is, controller1:joe/ password1;controller2:bob/ password2;controller3:ken/ password3. **Note:** If you want to use protected passwords, first run `./snapcreator-cryptpasswd` and then save the scrambled password in the config file.
NTAP_PWD_ PROTECTION (REQUIRED)	(Y|N)	Enables password protection. You must encrypt all passwords (storage system and applications or plug-ins) and save encrypted passwords in config file when this option is set to Y.
TRANSPORT (REQUIRED)	HTTP|HTTPS	This allows you to choose the protocol for API communications. **Note:** HTTPS may require openssl-devel libraries.
PORT (REQUIRED)		This is the used to communicate with the storage controller(s), normally (80/443).
LOG_NUM (REQUIRED)		This is the number of `.debug` and `.out` reports that Snap Creator has to retain.

Parameter	Setting	Description
CONFIG_TYPE (REQUIRED)	PLUGIN|STANDARD	We can have two types of configuration: plug-in, standard. We can use multiple plug-in configs to build up complex quiesce and unquiesce backup workflows.
CMODE_CLUSTER_USERS (REQUIRED FOR CLUSTER-MODE)		List of primary/secondary Cluster-Mode clusters and their corresponding usernames/ passwords Example: cluster1:joe/ password1;cluster2:bob/ password2 #
CMODE_CLUSTER_NAME (REQUIRED FOR CLUSTER-MODE)		Name of the primary Cluster-Mode cluster
CMODE_SNAPSHOT_FORC E_DELETE	(Y|N)	Setting which forces deletion of Snapshot copies which should be deleted based on Snapshot policy
LOG_TRACE_ENABLE	(Y|N)	(Y|N) Setting which enables trace messages. Trace messages are an extra level of debug

The following table lists the parameters required to connect to vFiler units and interfaces:

Parameter	Setting	Description
VFILERS		This is the list of vFiler units and their hosting appliances or volumes, that is, vFiler1@controller1:vol1,vol2, vol3;vFiler2@controller2:vol1; vFiler3@controller3:vol2,vol3. **Note:** HTTPS is not supported with vFilers

Parameter	Setting	Description
MANAGEMENT_ INTERFACES		This is an interface that you can specify for every physical appliance. All Data ONTAP API communications between Snap Creator and the controller occur through this interface. For example: MANAGEMENT_INTERFAC ES=controller1:controller1-mgmt;controller2:controller2-mgmt
SECONDARY_ INTERFACES		For every appliance or vFiler unit, you can specify a secondary interface source/ destination pair (name or IP). It is used for SnapMirror and SnapVault updates. For example, controller1:controller1-backup/ controller2-backup. Where: controller1 - Storage controller or VFiler unit name controller1-backup - Secondary interface for controller1/vFiler1 controller2-backup - Secondary interface for controller1/ vFiler1's SnapMirror or SnapVault destination **Note:** The SnapVault/ SnapMirror relationships must be configured to use this secondary interface. Snap Creator does not manage SnapMirror/ SnapVault relationships.

Parameter	Setting	Description
USE_PROXY	(Y|N)	Setting which allows API calls to go through DataFabric Manager server proxy instead of storage controller directly. If this option is used, NTAP_USERS is no longer required.
ALLOW_IP_ADDR	(Y|N)	Setting which allows IP address to be used for storage system. This applies to SnapVault, SnapMirror, and Protection Manager. Using IPs can create problems and should only be used under certain conditions.

The following table lists the parameters required to set up Snapshot copy:

Parameter	Setting	Description
NTAP_SNAPSHOT_ RETENTION_AGE		Allows you to define a retention age (in days) for Snapshot copies. If configured, Snapshot copies are deleted only if they exceed the number defined in NTAP_SNAPSHOT_ RETENTIONS and if they are older than the retention age (in days).
SNAPDRIVE	(Y|N)	Allows you to use SnapDrive instead of Data ONTAP API to create a Snapshot copy.
SNAPDRIVE_DISCOVERY	(Y|N)	Enables use of SnapDrive for the discovery feature. Requires SnapDrive to be configured and working on host where discovery is performed.

Parameter	Setting	Description
NTAP_SNAPSHOT_ DISABLE	(Y|N)	Disables the Snap Creator from creating a Snapshot copy so that Snap Creator can handle SnapVault or SnapMirror for SnapManager. For this setting to work, the SnapManager Snapshot copies need to follow this naming convention: <snapshot copy name>-<policy>_recent.
NTAP_SNAPSHOT_ NODELETE	(Y|N)	Overrides NTAP_SNAPSHOT_RETENT IONS and prevents Snapshot copies from being deleted. Leaving this variable on can make the volume full.
NTAP_SNAPSHOT_DELETE _BY_AGE_ONLY	(Y|N)	Requires NTAP_SNAPSHOT_RETENT ION_AGE and forces deletion based on Snapshot copy age rather than the number of Snapshot copies.
NTAP_SNAPSHOT_DEPEND ENCY_IGNORE	(Y|N)	Applies only to Snapshot copy deletion menu "-action delete". Manually deleting Snapshot copies with a dependency is not permitted.
NTAP_SNAPSHOT_ CREATE_CMD<#>		This SnapDrive command creates a Snapshot copy and flushes the file system buffers. < #> is a number from 01-99. **Note:** This is required if you enable the SNAPDRIVE option. Data ONTAP API is still used to perform everything else, but the SNAPDRIVE option creates Snapshot copies.

Parameter	Setting	Description
NTAP_CONSISTENCY_GROUP_SNAPSHOT	(Y|N)	Enables use of consistency groups. By using this setting, you can take a consistent (I/O fencing) Snapshot copy across more than one volume and multiple storage controllers. **Note:** Enabling this option requires NTAP_CONSISTENCY_GROUP_TIMEOUT
NTAP_CONSISTENCY_GROUP_TIMEOUT	urgent |medium |relaxed	Specifies the wait time for I/O fencing between volumes. Before we can create a Snapshot consistency group, all volumes must be quiesced (I/O fencing). The default setting and recommendation is medium (7 seconds); however, this depends on the number of volumes you have and the number of appliances that are involved. Urgent is 2 seconds, Medium is 7 seconds, Relaxed is 20 seconds.
NTAP_CONSISTENCY_GROUP_WAFL_SYNC	(Y|N)	Setting which can improve performance of the CG Snapshot by forcing a CP through a wafl-sync before the cg-start.
NTAP_SNAPSHOT_RESTORE_AUTO_DETECT	(Y|N)	Setting which if disabled always forces a SFSR when doing a single file restore.

The following table lists the parameters required to set up SnapVault:

Parameter	Setting	Description
NTAP_SNAPVAULT_UPDATE	(Y|N)	Allows you to turn off and turn on the SnapVault update function.

Parameter	Setting	Description
SNAPVAULT_ VOLUMES		This is the list of source appliances and volumes on which you want to perform a SnapVault update, that is, controller1:vol1,vol2,vol3;controller2:vol1;controller3:vol2,vol3.
		Note: For SnapVault and SnapMirror updates to work, the relationships must exist. Snap Creator does not create the relationships.
		Note: The host name(s) in the SnapMirror or SnapVault relationship must be the same as specified in the VOLUMES, SNAPMIRROR_VOLUMES, and SNAPVAULT_VOLUMES options. Also, the host where Snap Creator runs must be able to resolve the hostname(s).
		Note: For vSphere/vCloud plug-in, set the value to `auto:detect`
		Note: Host names should be the short host name (name that appears on storage controller command prompt), not the FQDN.

Parameter	Setting	Description
SNAPVAULT_QTREE_ INCLUDE		This is the list of source appliances and qtree paths that should be included in the SnapVault update. Without this option, all qtrees under a volume are vaulted by SnapVault if a relationship exists. Qtrees listed in the following example are vaulted by SnapVault and the rest are ignored by SnapVault: controller1:/vol/qtree/ qtree1,/vol/volume/ qtree2;controller2:/vol/volume/ qtree1.
NTAP_SNAPVAULT_ RETENTIONS		Determines the number of Snapshot copies on the SnapVault secondary that you want to retain for a given policy, that is, `daily: 21`,`weekly:12`,`monthly:3`.
NTAP_SNAPVAULT_ RETENTION_AGE		Allows you to define a retention age (in days) for SnapVault Snapshot copies. If configured, SnapVault Snapshot copies are deleted only if they exceed the number defined in NTAP_SNAPVAULT_ RETENTIONS and if they are older than the retention age (in days).

Parameter	Setting	Description
NTAP_SNAPVAULT_SNAPSHOT	(Y|N)	Enables use of SnapVault Snapshot copies; that is, Snapshot copies that are compatible with the Storage Controller SnapVault scheduler. When using this option, Snapshot delete is handled by the Storage controller and not by the Snap Creator. Additionally, Snapshot copies are named as follows: sv_<POLICY>.<##>. The policy name comes from the NTAP_SNAPSHOT_RETENTIONS parameter and the retention set is also applied to the Storage Controller SnapVault schedule.
NTAP_SNAPVAULT_NODELETE	(Y|N)	Overrides NTAP_SNAPVAULT_RETENTIONS and prevents Snapshot copies from being deleted. Leaving this on can cause your volume to fill up.
NTAP_SNAPVAULT_RESTORE_WAIT	(Y|N)	In the case of SnapVault restore, it forces Snap Creator to wait for the operation to complete. This is recommended because after the SnapVault restore completes, Snap Creator prompts the user to delete the restore Snapshot copies that get created on primary storage and are no longer needed.
NTAP_SNAPVAULT_ WAIT		This is the wait time (in minutes) for the SnapVault update process to complete before taking a Snapshot copy on the SnapVault secondary.

Parameter	Setting	Description
NTAP_SNAPVAULT_MAX_ TRANSFER		This is the maximum bandwidth SnapVault is allowed to use in kbps. If it is not set, SnapVault uses the maximum available bandwidth.

The following table lists the parameters required to set SnapMirror:

Parameter	Setting	Description
NTAP_SNAPMIRROR_ UPDATE	(Y|N)	Allows you to turn off and turn on the SnapMirror update function.
NTAP_SNAPMIRROR_ CASCADING_UPDATE	Y/N	Allows you to turn off and turn on the cascading SnapMirror update function. This is a SnapMirror update using a SnapVault destination volume. **Note:** This is not supported for Data ONTAP 8.1 Cluster-Mode
SNAPMIRROR_ VOLUMES		This is the list of source appliances and volumes on which you want to perform a SnapMirror update, that is, controller1:vol1,vol2,vol3;controller2:vol1;controller3:vol2,vol3. Note: For vSphere/vCloud plug-in set the value to auto:detect
SNAPMIRROR_ CASCADING_VOLUMES		List of SnapVault destination appliances and volumes where, after a SnapVault update, you want to perform a SnapMirror update, that is, sec-controller1:vol1-sec,vol2-sec.

Parameter	Setting	Description
NTAP_SNAPMIRROR_ WAIT		This is the wait time (in minutes) for the SnapMirror update process to complete before creating a clone on the SnapMirror destination. If NTAP_CLONE_SECONDARY=Y, Snap Creator waits until the SnapMirror update is complete before proceeding. **Note:** This can only be used with NTAP_CLONE_SECONDARY and ACTION clone_vol (only volume clones are currently supported).
NTAP_SNAPMIRROR_ USE_SNAPSHOT	(Y|N)	If enabled, the SnapMirror update uses the newly created Snapshot copy, thus creating a Snapshot copy on the SnapMirror destination. **Note:** This is required for NTAP_CLONE_SECONDARY because a Snapshot copy is needed in order to create a clone on the SnapMirror destination.
NTAP_SNAPMIRROR_MAX _TRANSFER		This is the maximum bandwidth SnapMirror is allowed to use in kbps. If it is not set, SnapMirror uses the maximum available bandwidth.

The following table lists the parameters required to set up cloning:

Parameter	Setting	Description
NTAP_VOL_CLONE_ RESERVE	none | file volume	This is the space guarantee for a cloned volume.

Parameter	Setting	Description
NTAP_LUN_CLONE_ RESERVATION	true | false	If set to `true`, space is reserved for the cloned LUNs if the `clone_lun` Action is selected. Otherwise, space is not reserved.
NTAP_CLONE_IGROUP_ MAP		Specify the appliance, source volume, and an IGROUP. The IGROUP is then mapped to cloned LUNs that reside in the source volume or cloned LUNs that reside in the volume clone, that is, controller1:src_volume1/ igroup1;controller2:src_volume2/ igroup2. **Note:** LUN clones assume the same name as their parent volume or LUN and end with _CLONE, that is, if the volume is called myvol, its clone would be myvol_CLONE **Note:** Volume clones start with "cl_" and end with "-YYYYMMDDHHMMSS".
NTAP_CLONE_FOR_ BACKUP	(Y|N)	If enabled, clones (volume and LUN) are created and then deleted after the other operations are complete. Otherwise, clones are deleted before operations complete. **Note:** If you are backing up clones to tape, this should be set to `Y`. If you are doing database refreshes, then you should set it to `N`.

Parameter	Setting	Description
NTAP_CLONE_SECONDARY	(Y|N)	If enabled, clones are created on the SnapMirror destination after the SnapMirror update is complete. **Note:** This setting should be used with NTAP_SNAPMIRROR_USE_SNAPSHOT, NTAP_SNAPMIRROR_WAIT, NTAP_CLONE_SECONDARY_VOLUMES, and ACTION clone_vol.
NTAP_CLONE_SECONDARY_VOLUMES		This is a mapping of primary/secondary appliances and the secondary volumes. This is required so that Snap Creator can find the secondary volumes, that is, controller1:controller1-sec/vol1,vol2,vol3;controller2:controller2-sec/vol1;controller3:controller3-sec/vol2,vol3.
NTAP_NUM_VOL_CLONES		This is the number of volume clones you want to retain. This works in a similar way to the Snapshot retention policy. **Note:** This only works for volume clones that require a FlexClone license on the storage controller.
NTAP_NFS_EXPORT_HOST	Host IP	The hostname or IP address where the clone should be exported. This is the host where the user wants to mount the clone volume by using NFS.
NTAP_NFS_EXPORT_ACCESS	root | read-write | read-only	The host specified in NTAP_NFS_EXPORT_HOST receives access or permission to the clone volume. root - Root access is granted read-only - Read-only access is granted read-write - Read/Write access is granted.

Parameter	Setting	Description
NTAP_NFS_EXPORT_PERSISTENT	true | false	Determines if NFS export is persistent. If `true` is selected, the clone volume is exported and the `/etc/exports` file on the Storage Controller is updated.

The following table lists the parameters required to set up Protection Manager:

Parameter	Setting	Description
NTAP_PM_UPDATE	(Y|N)	Allows you to turn off and on the Protection Manager update that registers Snap Creator Snapshot copies in Protection Manager. **Note:** If NTAP_PM_UPDATE is enabled, you must configure NTAP_DFM_DATA_SET.
NTAP_DFM_DATA_SET		This is a list of appliances and Protection Manager data sets to volume correlations, that is, controller1:dataset1/vol1,vol2;controller1:dataset2/vol3.
NTAP_PM_RUN_BACKUP	(Y|N)	Starts the Protection Manager backup, checks the progress and status, and waits for it to complete.

Parameter	Setting	Description
NTAP_DFM_SNAPSHOT_FORMAT		Optional setting for the format of the secondary Snapshot copies when using Protection Manager. This option requires OnCommand 5.0 (DataFabric Manager) or higher. Required variable: `%T` - timestamp
		Optional variables are:
		`%R` - retention type
		`%L` - dataset label `%H` - storage controller `%N` - volume name `%A` - application specific data.
		If this option is not set then the default Protection Manager naming convention will be used. The naming convention can only be set at the time of dataset creation.

The following table lists the parameters required to set up Open Systems SnapVault:

Parameter	Setting	Description
NTAP_OSSV_ENABLE	(Y|N)	Enables the Open Systems SnapVault integration. This option must be used in combination with the NTAP_OSSV_HOMEDIR parameter. Open Systems SnapVault is also required on the host running Snap Creator.
		Note: When Open Systems SnapVault option is enabled, the path is specified as volumes. When specifying paths in windows for Open Systems SnapVault : should not be used. For example, if the path is `E:\DB` then it should used as `E\DB`.

Parameter	Setting	Description
NTAP_OSSV_HOMEDIR	/usr/snapvault	The path to the Open Systems SnapVault home directory, that is, `/usr/snapvault`
NTAP_OSSV_FS_SNAPSHOT	(Y|N)	This setting also requires the NTAP_OSSV_FS_SNAPSHOT_CREATE_CMD<##> and allows to create a file system Snapshot copy using OS / Filesystem command. The File system Snapshot copy is then transferred to the storage system using SnapVault.
NTAP_OSSV_FS_SNAPSHOT_CREATE_CMD<##>		These are scripts or commands to be executed during or before the Open Systems SnapVault backup process, where ## is a number from 01- 99. This can be used to perform backup file system Snapshot copies by using Open Systems SnapVault.

The following table describes the Operations Manager settings:

Parameter	Setting	Description
OM_HOST		The name or IP address of the Operations Manager host.
OM_USER		The user name of an Operations Manager user who has permission to create events.
OM_PWD		The password for the Operations Manager user.
OM_PORT		The port to use for communications with Operations Manager; 8080 is the default http port that the Operations Manager uses.

Parameter	Setting	Description
OM_EVENT_GENERATE	(Y|N)	Enables or disables event creation in Operations Manager.

The following table describes the different APP commands:

Command	Setting	Description
APP_CLONE_FOLLOW_ UP_ CMD<##>		These are scripts or commands to be executed after the database is cloned, where ## is a number between 01- 99. This can be used to perform application-specific follow-up activities on SAP systems, such as, installing a SAP license, adjusting database tables, deleting or updating content, and starting up the application.
APP_QUIESCE_CMD<##>		These are scripts or commands that put your application into backup mode, where ## is a number between 01-99. **Note:** This is ignored if you use APP_NAME because it is handled internally in Snap Creator.
APP_UNQUIESCE_ CMD<##>		These are scripts or commands that take your application out of backup mode, where ## is a number from 01-99. **Note:** This is ignored if you use APP_NAME because it is handled internally in Snap Creator.
ARCHIVE_CMD<##>		Handles database archiving. It can also be used as a wrapper to run other scripts. The archive command, where ## is a number from 01-99.

The following table describes the different PRE commands:

Command	Setting	Description
PRE_APP_QUIESCE_ CMD<##>		This is the pre application backup start command, where ## is a number from 01-99.
PRE_NTAP_CMD<##>		This is the pre Snapshot command, where ## is a number from 01-99; it runs before all operations.
PRE_APP_UNQUIESCE_ CMD<##>		This is the pre application backup stop command, where ## is a number from 01-99.
PRE_NTAP_CLONE_ DELETE_CMD<##>		This is the pre clone delete command, where ## is a number from 01-99. **Note:** The purpose of clone delete command(s) is to call a mount script or commands so that cloned LUNs can be mounted for the purpose of backing up (probably to tape).
PRE_EXIT_CMD<##>		This is an optional command that is run after a fatal error occurs but before Snap Creator exits. This is useful to revert to the state it was before Snap Creator ran. **Note:** This command returns an application into normal operation mode before Snap Creator exits due to an error. **Note:** This is ignored if you use APP_NAME because it is handled internally in Snap Creator.

Command	Setting	Description
PRE_RESTORE_CMD<##>		This is an optional command that can be run before you enter an interactive restore. This allows you to interact with the application being restored. For example, you might want to shut down the application before performing a restore. **Note:** This is not supported with MySQL plug-in.
PRE_CLONE_CREATE_CMD<##>		This is an optional command that can be run before Data ONTAP API cloning operations occur, where ## is a number from 01-99.

The following table describes the different POST commands:

Command	Setting	Description
POST_APP_QUIESCECMD<##>		This is a post application backup start command, where ## is a number from 01-99.
POST_NTAP_CMD<##>		This is a post command, where ## is a number from 01-99. This runs after all operations are complete.
POST_APP_UNQUIESCE_CMD<##>		This is a post application backup stop command, where ## is a number from 01-99.
POST_NTAP_DATA_TRANSFER_CMD<##>		This is a post data transfer command that runs after SnapVault or SnapMirror transfer, where ## is a number from 01-99.

Command	Setting	Description
POST_RESTORE_ CMD<##>		This is an optional command that can be run after you complete an interactive restore. It allows you to interact with the application being restored. After your restore is complete, you might want to start the application. **Note:** This is not supported with MySQL plug-in.
POST_CLONE_CREATE_ CMD<##>		This is an optional command that can be run after Data ONTAP API cloning operations occur, where ## is a number from 01-99. The commands are used to perform operations such as mounting cloned file systems.

The following table describes the mount and umount commands:

Command	Setting	Description
MOUNT_CMD<##>		Mount commands are used to mount file system for cloning or mount actions, where ## is a number starting from 01 - 99.
UMOUNT_CMD<##>		Umount commands are used to mount file system for cloning or mount actions, where ## is a number starting from 01 - 99.

Note: You should use MOUNT_CMDS and UMOUNT_CMDS for mount/umount commands instead of Snap Creator pre/post commands for cloning.

The following table lists the parameters required to set up event management:

Parameter	Setting	Description
NTAP_ASUP_ERROR_ ENABLE	(Y|N)	Enables Snap Creator error messages to also log an auto support message on the storage controller. Snap Creator always creates an info auto support message when the backup has started and is complete.
SENDTRAP		This command interfaces with your monitoring software or e-mail allowing you to pass alerts generated from Snap Creator into your own monitoring infrastructure. The *%MSG* variable is the message sent from Snap Creator. The following is an example of how to send an email on a UNIX system: `SENDTRAP=/usr/bin/mailx -s %MSG myaddress@mydomain.com </dev/null`
SUCCESS_TRAP		This command interfaces with your monitoring software or e-mail allowing you to pass the success message generated from Snap Creator into your own monitoring infrastructure. The *%SUCCESS_MSG* variable is the success message for Snap Creator. The following is an example of how to send an email on UNIX system: `SUCCESS_TRAP=/usr/ mailx -s %SUCCESS_MSG myaddress@mydomain.com </dev/null`

Parameter	Setting	Description
SUCCESS_MSG		After a successful Snap Creator backup, this setting logs the message defined and also sends it to SUCCESS_TRAP, if defined, or to SENDTRAP, if SENDTRAP is defined.

The following table lists the parameters required for client/server configuration:

Parameter	Setting	Description
SC_AGENT	\<hostname or IP \>:\<port\>	Snap Creator has the capability to perform tasks on remote hosts. A task is either a defined plug-in (parameter APP_NAME) or a command specified with the parameters _CMD , for example, NTAP_SNAPSHOT_CREATE _CMD01. To specify a remote host, enter its name or IP address followed by a colon and the port the Snap Creator Agent is listening on. On the remote host, start the Snap Creator Agent by running the command: **`<path to scAgent_v<#>>/ snapcreator-start-agent <port>`**
SC_CLONE_ TARGET	\<hostname or IP of the clone target\>:\<port\>	Snap Creator has the capability to perform clone operations. Using the action `clone_vol` in combination with {PRE| POST}_CLONE_CREATE_C MDxx, you can handle the storage objects on the remote side. For example, mounting/ unmounting file systems. To specify a clone target, enter its name or IP address followed by a colon and the port the Snap Creator Agent is listening on.

Parameter	Setting	Description
SC_AGENT_ TIMEOUT	Time (in seconds)	Specifies the timeout in seconds. The implemented client/server architecture uses a timeout mechanism. This means that if the client does not respond in the specified interval, the server fails with a timeout message. However, the task on the client is not aborted and requires further investigation. On a server with high load or known long-running tasks like own scripts or complex SnapDrive operations, it might be necessary to extend the timeout and adapt this value to your own requirements. By default, a timeout of 300 seconds is used.
SC_AGENT_WATCHDOG_E NABLE	(Y|N)	Enables or disables the agent watchdog process. When the agent receives a quiesce request, the watchdog process starts. The watchdog process waits for the SC_AGENT_UNQUIESCE_TI MEOUT and unquiesces the application. If an unquiesce request is received by the agent, the watchdog process is terminated. **Note:** For all plug-ins the default setting is Y. For VIBE plug-in the default setting is N, and it should always be N.

Parameter	Setting	Description
SC_AGENT_UNQUIESCE_TIMEOUT	Time (in seconds)	This optional setting specifies the timeout in seconds. If the communication with the agent is not possible and an application is in the quiesce state, the agent automatically returns the application into its normal mode of operation without communication from the server. If this setting is not set, then the unquiesce timeout is set to whatever the SC_AGENT_TIMEOUT is plus 5 seconds.
SC_TMP_DIR	(Y|N)	Allows you to use a user-defined, alternate temporary directory to store the Snap Creator related files. The user creates the directory and manages the user access. The plug-ins use temporary files to interact with the database. The temp files are created in the host's default temp directory, which has write access to all the users. If the directory is full, Snap Creator displays an error while creating the temp files.
SC_AGENT_LOG_ENABLE	(Y|N)	Setting which enables logging on agent. The Snap Creator Server sends operations to the agent. If something happens before agent sends callback to server it is possible messages could be lost. This allows agent messages to be logged on agent so they are never lost.

Snap Creator Agent configuration

If the Snap Creator Server uses a profile that has commands or scripts in PRE, POST, or APP other than the built-in application plug-ins command to be executed on the host where the agent resides, then those commands or scripts must be added to `/path/to/scAgent_v<#>/config/agent.conf`.

The `*` wildcard stands for any commands, but regular expressions can be used to be more restrictive. Each command or script should be added to the file as follows:

```
command: echo
```

```
command: /bin/mount
```

```
command: /path/to/myscript
```

In this example, the agent allows the Snap Creator Server to run `echo`, or `/bin/mount`, or `/path/to/myscript` in addition to the application plug-ins. If the application plug-ins are not used and the agent is required, run the application quiesce and unquiesce commands for application consistency.

Note: The `*` wildcard may be used to allow all commands. However, it is not recommended, due to security reasons.

```
command: *
```

Snap Creator Backup process

The Snap Creator backup process is the same for all the applications and involves running optional scripts, commands, or using the plug-in interfaces.

The scripts or commands are triggered by using PRE and POST command parameters in the configuration file. All the PRE and POST commands can be run remotely by using the Snap Creator Agent. For the application quiesce and unquiesce, you must use the Snap Creator application plug-ins or run commands and scripts.

The backup process involves the following steps:

1. Achieving application consistency

2. Achieving file system consistency (optional)

3. Creating a Snapshot copy

4. Returning the application to normal mode

5. Cloning the LUN or volume (optional)

6. Performing various SnapMirror or SnapVault functions (optional)

7. Deleting old Snapshot copies, thus managing retention policies on both primary and secondary storage devices in the case of SnapVault or SnapMirror

List of commands

Application quiesce and unquiesce commands

The quiesce and unquiesce commands are used to achieve application consistency when not using Snap Creator application plug-ins. Snapshot copies of volumes without application consistency are only crash-consistent.

Archive commands

Archive commands are user-defined commands or scripts that are run before the POST commands (last command that runs). The purpose of the archive commands is to provide the ability to interface with archiving tools after a backup is performed.

PRE commands

PRE commands are user-defined commands or scripts that are run before the following operations:

- The application `quiesce` commands or application integration plug-ins
- The Data ONTAP API or SnapDrive calls
- The application `unquiesce` command or application integration plug-ins
- The volume or LUN clone delete commands are run

The following are the different types of PRE commands:

- `PRE app quiesce`
- `PRE app unquiesce`
- `PRE clone create`
- `PRE clone delete`
- `PRE exit`
- `PRE restore` (in the case of interactive restore)

A PRE command can be used for a file system synchronization or consistency check before calls using Data ONTAP API or SnapDrive are made. For example, run the file system command or script as a PRE command.

Note: PRE commands or scripts that do not exit with status 0 are handled as an error within Snap Creator.

POST commands

POST commands are user-defined commands or scripts that are run after the application quiesce command, the Data ONTAP API calls, and the application unquiesce command.

The following are the different types of POST commands:

- `POST application quiesce`
- `POST application unquiesce`
- `POST data transfer`
- `POST clone create`
- `POST restore` (in the case of interactive restore)

A POST command can be used after the application `unquiesce` command is run to make sure that the database is running in normal mode. For example, run the database check command or script as a POST application `unquiesce` command.

Note: POST commands or scripts that do not exit with status of 0 are handled as an error within Snap Creator.

Running Snap Creator Server using CLI

You can perform actions such as creating a Snapshot copy, volume clone, and LUN clone by running the Snap Creator Server and the associated parameters by using the CLI.

About this task

You should schedule the Snap Creator Server from either UNIX Cron, Windows task manager, or the Snap Creator built-in GUI scheduler. When scheduling through the Windows task manager, create a `.bat` file.

Step

1. Run the Snap Creator Server by using the following command:

   `./snapcreator --profile Config --action Action --policy Policy Optional Arguments`

   The following table lists the Snap Creator Server parameters:

Parameter	Description
--profile <Profile>	Name you gave to the directory/file without the `.conf` suffix. To create alternate configuration files under the same profile, use the `-config` option.
list	Displays all configurations known to Snap Creator. Do not use `list` as a profile name, because it only displays configurations. Example: `./snapcreator --profile list`
setup	Runs the Snap Creator setup that configures both the GUI and Snap Creator itself. Example: `./snapcreator --profile setup`

Parameter	Description
--action <Action> (snap|clone_vol|clone_lun| clone_del|arch|quiesce|unquiesce|discover| restore|delete|snaplist|clonelist|pmsetup|ossv| mount|umount)	There are currently ten possible actions: create a Snapshot copy (snap), perform an Open Systems SnapVault backup, make a Snapshot copy as well as a volume clone (clone_vol), make a Snapshot copy as well as a LUN clone (clone_lun), handle only archiving for an application (arch), perform an interactive restore (restore), perform an interactive delete (delete), list Snapshot copies for a given policy (snaplist), list volume clones (clonelist), and configure a Protection Manager data set (pmsetup)
snap	Makes a Snapshot copy. Example: `./snapcreator --profile Profile --action snap --policy Policy Optional Arguments`
ossv	Uses Open Systems SnapVault to perform the backup; no Snapshot copy is created. Example: `./snapcreator --profile Profile --action ossv --policy Policy Optional Arguments`

Parameter	Description
clone_vol	Makes a Snapshot copy plus whatever else is configured and then uses that Snapshot copy to make a volume clone. This requires a FlexClone license. After the volume is cloned, an IGROUP is mapped to all the LUNs that reside in the cloned volume by using the NTAP_CLONE_IGROUP_MAP option in the configuration file.
	Note: The format of cloned volume in Snap Creator 3.5.0 is cl_configfile_volume_ YYYYMMDDhhmmss as compared to Snap Creator 3.4.0 (cl_<source volume>_YYYYMMDDhhmmss).
	Hence Snap Creator 3.5.0 does not list the old format cloned volumes. You have to delete the old cloned volumes and create a new cloned volume.
	`./snapcreator --profile `*`Profile`*`  clone_vol --policy `*`Policy Optional Arguments`* If the SC_CLONE_TARGET parameter and the options necessary for the database clone handling are set after cloning the volume, the database cloning is complete.
clone_lun	Creates a Snapshot copy plus whatever else is configured and then uses that Snapshot copy to make a LUN clone of all LUNs that reside in the source volume. After the LUNs are cloned, an IGROUP is mapped to all the cloned LUNs that reside in the source volume by using the NTAP_CLONE_IGROUP_MAP option in the configuration file. Note: Because there is a possibility that Snapshot copies can get locked by cloned LUNs, this is not a recommended method. However, this depends on whether the customer owns a FlexClone license. If the customer owns a FlexClone license, clone_vol, which uses FlexClone, should be used.
	`./snapcreator-profile `*`Profile`*` -- action clone_lun --policy `*`Policy Optional Arguments`*

Parameter	Description
clone_del	Deletes a volume clone created by Snap Creator according to the volume clone settings defined in the configuration file. You can use this option to separate the clone delete workflow from that of clone create. Some third-party integrations, such as BRTools by SAP, require separate clone create and delete workflows.
arch	Provides archive log management functionality as a separate workflow based on application plug-in settings as defined by the configuration file. Snap Creator performs archive log management for a given application. The purpose of this action is to provide granularity allowing other tools to better integrate with Snap Creator. Additionally, this functionality allows for multiple application backup workflows that are required in certain virtualized environments. Example: `./snapcreator-profile ` *`Profile`* ` --action arch ` *`Optional Arguments`*
quiesce	Provides quiesce functionality as a separate workflow based on application plug-in settings as defined by the configuration file. Snap Creator quiesces a given application. The purpose of this action is to provide granularity allowing other tools to better integrate with Snap Creator. Additionally, this functionality allows for multiple application backup workflows that are required in certain virtualized environments. Example: `./snapcreator-profile ` *`Profile`* ` --action quiesce ` *`Optional Arguments`*

Parameter	Description
unquiesce	Provides unquiesce functionality as a separate workflow based on application plug-in settings as defined by the configuration file. Snap Creator unquiesces a given application. The purpose of this action is to provide granularity allowing other tools to better integrate with Snap Creator. Additionally, this functionality allows for multiple application backup workflows that are required in certain virtualized environments. Example: `./snapcreator --profile `*`Profile`*` --action unquiesce `*`Optional Arguments`*
discover	Provides discover functionality as a separate workflow based on application plug-in settings as defined by the configuration file. Snap Creator performs discovery for a given application. The purpose of this action is to provide granularity allowing other tools to better integrate with Snap Creator. Example: `./snapcreator --profile `*`Profile`*` --action discover `*`Optional Arguments`*
scdump	Collects all support information for technical support and places everything into a `.zip` file located under the root Snap Creator directory. Collected information consists of logs, configuration files, storage controller, OS, database (if applicable), and SnapDrive (if applicable) information. Example: `./snapcreator --profile `*`Profile`*` --action scdump `*`Optional Arguments`*

Parameter	Description
restore	Provides an interactive restore. You can perform a volume, file, or SnapVault restore. File restore is for LUNs. A volume restore is only recommended in case of a disaster. Otherwise, you should always recover files. For NAS, you can recover files by simply copying files out of the ~snapshot directory so that there is no need to handle NAS file restore with Snap Creator. A SnapVault restore restores a qtree on the secondary storage back to the primary storage either on its original or an alternate location. Example: `./snapcreator --profile `*`Profile`*` --action restore --policy `*`Policy Optional Arguments`*
delete	Guides you through an interactive Snapshot copy delete menu for a given Snap Creator policy. Example: `./snapcreator --profile `*`Profile`*` --action delete --policy `*`Policy Optional Arguments`*
snaplist	Lists all Snapshot copies that are being managed by Snap Creator. It displays Snapshot copies on the primary as well as the secondary storage. Example: `./snapcreator --profile `*`Profile`*` --action snaplist `*`Optional Arguments`*
clonelist	Lists all volume clones that are being managed by Snap Creator. It shows volume clones on the primary as well as the secondary storage. Example: `./snapcreator --profile `*`Profile`*` --action clonelist `*`Optional Arguments`* **Note:** This action only lists the volume clones created using Snap Creator 3.5.0 and does not list the volume clones from previous versions of Snap Creator.

Parameter	Description
dpstatus	Shows detailed information about SnapVault or SnapMirror relationships. Example: **./snapcreator --profile _profile_ --action dpstatus**
pmsetup	Creates a Protection Manager Dataset for the given configuration. Example: **./snapcreator --profile _Profile_ --action pmsetup _Optional Arguments_** **Note:** After creating the Protection Manager dataset, you need to go into Protection Manager to configure it. The configuration involves adding relationships and defining the protection policy.
--policy <Policy>	The name of the Snapshot policy defined in NTAP_SNAPSHOT_RETENTIONS and possibly NTAP_SNAPVAULT_RETENTIONS. You can name the Snapshot policy whatever you want, but it is important that the name you pass Snap Creator as- policy be exactly the same as defined in NTAP_SNAPSHOT_RETENTIONS as well as possibly NTAP_SNAPVAULT_RETENTIONS if you are using SnapVault. You can also have as many of these as you want, but with different retentions. **Note:** If you use SnapDrive to create the Snapshot copies, use lowercase. SnapDrive (at least Windows) cannot differentiate between uppercase and lowercase.
mount	Mount a Snapshot copy using NFS or SnapDrive
umount	Unmount a Snapshot copy using NFS or SnapDrive

The following table lists the optional parameters:

Parameter	Description
--config	Allows you to specify an alternate configuration file located under the `/path/to/scServer_v<#>/Config>` directory. Example: `./snapcreator --profile Profile --action Action --policy Policy --config Alternate Config` **Note:** This option is required when the profile `/ path/to/scServer_v<#>/configs/<profile>` and the configuration do not match `/path/to/scServer_v<#>/configs/<profile>/<config>.conf`.
--global	Allows you to use a global configuration file. There are two possible global configuration files you can have. Environment Global Config: configs/global.conf Profile Global Config: configs/<profile>/global.conf Parameters are loaded first from environment global, then the profile global, and finally your actual config file. Any duplicate parameters are overwritten by your actual config file. Example: `./snapcreator --profile Profile --action Action --policy Policy --config Alternate Config --global`
--verbose	Displays all logging information to STDOUT. This is an optional setting and is used mostly for testing and running Snap Creator manually. Example: `./snapcreator --profile Profile --action Action --policy Policy --config Alternate Config --verbose`
--debug	Displays all logging information to STDOUT and the log file. This is an optional setting and is for debugging problems. Example: `./snapcreator --profile Profile --action Action --policy Policy --config Alternate Config --verbose-debug`

Parameter	Description
--version	Prints the Snap Creator version. Example: `./snapcreator -version`
--cryptpasswd	Encrypts a password for storing it in a configuration file. Example: `./snapcreator --cryptpasswd`
--config_dir	Specifies an alternate path to the Snap Creator /configs directory. This is a CLI-only option and is not supported by the GUI.
--log_dir	Specifies an alternate path to the Snap Creator /logs directory. This is a CLI-only option and is not supported by the GUI.
-- snap_name <snapshot>	The name of the Snapshot copy which should be used. Applies to action clone_vol, mount, and umount and restore operations
--clone_name <clone>	The name of the clone which should be used. Applies to action clone_del and umount
--volume_name <volume>	The name of the primary volume which should be used. Applies to action restore and delete
--file_names <files>	A comma separated list of the full path to files or LUNs which should be restored. Applies to action restore when using non-interactive mode
--non_interactive	Runs the operation in non-interactive mode. Applies to action restore and delete

Running Snap Creator Agent using CLI

You can run the Snap Creator Agent and the associated parameters by using the CLI.

Step

1. Start the Snap Creator Agent by running the following command:

   `./snapcreator --start-agent <port> <Optional Arguments>`

   where:

   - `<port>`: Starts the Snap Creator Agent on the specified port. If no port is specified, port 9090 is used.
   - `<Optional arguments>`: - - debug: Displays all logging information to STDOUT and the log file.

   Note: You can start the Snap Creator Agent automatically on UNIX by using the `/path/to/scAgent_v<#>/bin/scAgent` script.

   You can start the agent in multithread mode by using the following command:

   `./snapcreator --start-multithreaded-agent <port>`

Running Snap Creator using GUI

You can perform actions such as creating a Snapshot copy, volume clone, and LUN clone using the Snap Creator GUI.

You can upload or download a configuration file through GUI by using [upload icon] upload and [download icon] download configuration icons.

You can perform the following actions by using the [actions icon] Actions drop-down Configuration Content pane:

- [icon] LUN clone
- [icon] Volume clone
- [icon] Snapshot
- [icon] Restore
- [icon] Scdump
- [icon] Discover
- [icon] Archive Log
- [icon] Quiesce
- [icon] Unquiesce

Note: Snap Creator 3.5.0 GUI supports performing the preceding actions with global options enabled.

Creating a schedule

You can create a schedule and run the tasks using the GUI.

Steps

1. Click the **Schedules** tab on the left to load the **Management Schedules** screen.

2. Click [icon] Add new task

3.
    In the **New Task** window, enter the details and click Save.

Result

The new schedule is listed and you can view the details in the Configuration Details pane on the right.

To run the task, click Run task and to edit the task, click Edit task.

> **Note:** If you create as hourly schedule with n minutes, the first job runs after n minutes and thereafter after every 1 hour.

> Example: If you create a schedule on 12.56 PM with Hourly and 25 minutes. The job first runs at 1.21 PM then it runs at 2.21 and so on.

For information about creating a schedule using cron refer the Cron Trigger tutorial.

Related information

Quartz CronTrigger Tutorial

Creating multiple users

You can create multiple users and perform several actions like assigning profiles to the user, assigning user actions, and editing password using the GUI.

Steps

1. Click the **Users** tab to load the **Management Users** screen.

2.
    Click Add new user and enter the details in **New User** window.

3.
    Select the user and click Assign profiles.

4. In the **Assign profiles to the user** window, select the profiles, drag and drop from the left pane to
    the right pane and click Save.

5.
    Select the user and click Add User actions.

6. In the **Assign Actions to user** window, select the actions, drag and drop from the left pane to the
    right pane and click Save.

Job monitoring

You can monitor the jobs using the GUI.

Steps

1. Click the **Job Monitor** tab to load the **Management Job Monitor** screen.

   You can see list of jobs and details like Job ID, Job status, Start time, End time, and so on.

2. To start or stop job monitoring, select the job and click ⏵ Start Job Monitor or ⏹ Stop job Monitor.

   Note: To download the logs, click Download Logs on the right side of the screen and you can set the Job Monitor size and the left bottom of the screen.

Viewing data and log details

You can view the volume, Snapshot copy, and volume clone details for each configuration under the Data tab and log details under Reports tab.

Steps

1. Click the **Volumes** tab under **Data** to view the volume details like **Total size**, **size available**, **state**, and so on.

2. Click the **Snapshots** tab to view the Snapshot copy details like Snapshot copy name, access time, dependency, and so on.

   The Snapshot copies can be renamed or deleted by clicking the rename and delete icons.

3. Click **Volume Clones** to view Volume clone details like Controller, clone, parent Snapshot, and so on.

4. Click **Logs** tab under **Reports** and select the Backup profile, configuration, log type, and log to view the Backup log details.

Performing restore using Snap Creator

You can perform Volume restore, Single File restore, VMware restore, and Domino restore using Snap Creator.

Note: If you use SnapDrive for Windows you must use SnapDrive for restore and NOT Snap Creator. SnapDrive stores metadata inside Snapshot copies which is needed when it performs a restore.

Performing Volume restore

You can perform a volume restore using CLI or GUI.

Step

1. Depending on whether you want to use CLI or GUI, perform the appropriate action:

If you want to use	Do this

CLI	Enter the following command:
	
	 `./snapcreator --profile <Profile> --config <config> --action restore --policy <Policy>`
	
	 Note: To perform a volume restore noninteractively, use the following command:
	
	 `./snapcreator --profile <Profile> --action restore --policy <Policy>--config <config> --volume_name <volume> --snap_name <snapshot> --non_interactive --debug --verbose`

GUI	a. Select the configuration file and in the configuration content pane, click Action and select Restore. b. Enter Restore details and in the Restore type drop-down list, select **Volume Restore**. c. Proceed through the wizard.

Performing Single file restore

You can perform a single file restore using CLI or GUI.

Step

1. Depending on whether you want to use CLI or GUI, perform the appropriate action:

If you want to use	Do this

CLI	Enter the following command:
	
	`./snapcreator --profile <Profile> --config <config> --action restore --policy <Policy>`
	.
	
	Note: To perform a single file restore noninteractively, use the following command:
	
	`./snapcreator --profile <Profile> --config <config> --action restore --policy <Policy>--volume_name <volume>--snap_name <snapshot> --file_names <files> --non_interactive --verbose`
	.

GUI	a. Select the configuration file and in the configuration content pane, click 🔲 Action and select 📥 Restore b. Enter Restore details and in the Restore type drop-down list, select **Single file Restore**. c. Proceed through the wizard.

Performing VMware restore

You can perform VMware restore using CLI or GUI.

About this task

In certain VMware environments, restores can take a long time. In this case, you can either use the Snap Creator CLI or set up two agents - one for backup and one for restore.

Note: VMware restore using the GUI is supported only for Snap Creator Agent.

Step

1. Depending on whether you want to use CLI or GUI, perform the appropriate action:

If you want to use	Do this
CLI	Enter the following command: `./snapcreator --profile `*`<Profile>`*` --config `*`<config>`*` --action` `restore --policy `*`<Policy>`*` --snap_name `*`<snap name>`* .
GUI	**a.** Select the configuration file and in the configuration content pane, click 🔳 Action and select 📥 Restore. **b.** Enter Restore details and in the Restore type drop-down list, select **VMware Restore**. **c.** Proceed through the wizard.

Performing restore with Domino plug-in

With Snap Creator 3.5.0 you can perform up to the minute restore and selectable point in time restore with Domino plug-in.

The Domino plug-in has multiple restore options:

- Volume Restore (point-in-time only): This option restores a volume to the point-in-time of the selected Snapshot copy.
- Single File Restore - Point-in-time: This option restores a single file to the point-in-time of the selected Snapshot copy.
- Single File Restore - Up-to-the-minute: This option restores a single file and then plays forward the Domino transaction logs to the most recent copy.
- Single File Restore - Selectable Point-in-time: This option restore a single file then plays forward the Domino transaction logs to a specified point-in-time.

All these options are available in both the GUI and the CLI.

> **Note:** Single File Restore operations work only with NFS. For Up-to-the-minute and Selectable point-in-time single file restore, Domino transaction logging must be enabled.

In all the options the changeinfo is written back to database(s) after a restore. The DOMINO_RESTORE_DATA_PATH parameter in the config file must be set to the path where the Domino data is being restored. It is likely that this path changes depending on the type of restore being performed. Typical use cases for setting the DOMINO_RESTORE_DATA_PATH variable are:

- For a volume restore: DOMINO_RESTORE_DATA_PATH = DOMINO_DATA
- For a single database restore: DOMINO_RESTORE_DATA_PATH= a subdirectory on the same volume that the Domino Data volume exists on.

If the DOMINO_RESTORE_DATA_PATH is not set properly, the change info will not be applied to the database which results in a post restore error. The file will still be restored, but the necessary changeinfo will not be applied.

Note: While performing a single file restore, the replication of the database will be disabled.

Performing Volume restore for Domino using CLI

You can perform a full volume restore for Domino using the CLI.

Before you begin

You must have stopped the Domino server.

Steps

1. Initiate the CLI command for restore:

   Example

   ```
   snapcreator.exe --action restore --profile domino --policy daily
    --config lindom8
   ```

   where

   - --action restore: Indicates the action taken. In this case restore will be performed.
   - --profile domino: Indicates the name of the profile in this case domino.
   - --policy daily: Indicates the policy used. In this case daily.
   - --config lindom8: Indicates that the lindom8 config file is used. This parameter is required when multiple config files are present within the profile or when the profile name is different from the config name

2. Select the volume to be restored by typing the number next to the volume name.

3. Select the Snapshot copy to be restored by typing the number next to the volume name.

4. Select the type of restore.

5. Confirm the selected settings.

6. Select another volume to restore if desired.

   Note: It is not recommended to use option q unless an error has occurred. Using q or quit option causes Snap Creator to exit without performing any post restore activities.

7. The restore process is complete.

   Example

   ```
   INFO: Completing restore and running an post-restore commands that may
   be defined.
   ```

Performing Volume restore for Domino using GUI

You can restore the entire volume for Domino using GUI.

Before you begin

You must have stopped the Domino server.

Steps

1. Select the configuration file and in the **configuration** pane, click Action and select Restore.

2. An optional prompt appears asking if a global config file will be used. If yes, select the checkbox. If no, accept the default unselected status.

3. Enter Restore details and select **Volume restore** in the **Restore type** drop-down list.

4. Proceed through the wizard to complete the restore process.

After you finish

Start the Domino server.

Performing Single file restore for Domino using CLI

You can perform a single file restore for Domino using the CLI.

Before you begin

You must have stopped the Domino server.

Steps

1. Initiate the CLI command for restore.

   Example

   ```
   snapcreator.exe --action restore --profile domino --policy daily
    --config lindom8
   ```

   where

   - --action restore: Indicates the action taken. In this case restore will be performed.
   - --profile domino: Indicates the name of the profile in this case domino.
   - --policy daily: Indicates the policy used. In this case daily.
   - --config lindom8: Indicates that the lindom8 config file is used. This parameter is required when multiple config files are present within the profile or when the profile name is different from the config name

2. Select the volume to be restored by typing the number next to the volume name.

3. Select the Snapshot copy to be restored by typing the number next to the volume name.

4. Select the type of restore. For single file restore, select option 02.

5. This step asks for the file to be selected.

   For applications or file systems with a small number of files an automated menu can be displayed allowing for selected of a file. For Domino there can be hundreds or thousands of files, so it is recommended to manually enter the name of the file to restore.

   Example

   ```
   Would you like to bypass file selection and manually enter a file for
   restore (y|n)?
   ```

6. Enter the file name and the path to be restored.

   Note: This is asking for a path relative to the selected volume, so pay close attention to what already exists. Even though it is not displayed, the path ends with a "/".

7. Enter the local path on the storage system of the restored file.

8. Select the restore type:

   Note: After this point the restore process is the same for all three restore types except for Selectable point-in-time restore you must enter the time and date to which the Domino transaction logs will be played.

9. Select the replication option for this database.

10. Confirm the summary of the single file restore details.

11. Select if you want to restore to the file's original location.

12. Enter the alternate path to restore.

13. Confirm the settings and continue.

14. The restore process is complete at this stage but none of the post restore activities, such as applying change info, have yet occurred. To restore files on other volumes enter

    `c`

15. The post restore processes run in the background and typically will not be displayed on screen.

    Example

    ```
    INFO: Completing restore and running an post-restore commands that may
     be defined
    ```

16. The restore process is complete.

Performing Single file restore for Domino using GUI

You can perform the single file restore for Domino using the GUI.

Steps

1. Select the configuration file and in the **configuration** pane, click Action and select Restore.

2. An optional prompt appears asking if a global config file will be used. If yes, select the checkbox. If not, accept the default unselected status.

3. Enter Restore details and select **Single File restore** in the **Restore type** drop-down list.

4. Browse through the directory structure and select the file to restore. With Domino, only a single file can be restored at a time.

   Note: The path is from the perspective of the storage system, not the server file system. This is because the file is restored at the storage system level.

5. Browse through the directory structure and select the location where the file will be restored.

   Note: The path is from the perspective of the storage system, not the server file system. This is because the file is restored at the storage system level.

6. Select the restore type.

   - Point-in-time
   - Up-to-the-minute
   - Selectable point-in-time

   Note: You can disable Domino replication upon restore. This option zaps the replica ID keeping changes to the database from replicating back to the database after a restore. Check or uncheck the box as desired to set this option.

7. Proceed through the wizard to complete the restore process.

Using the Plug-in Framework to create custom plug-ins

The plug-in framework enables you to create your own plug-ins for Snap Creator or reuse existing plug-ins. The plug-in provides Snap Creator with the steps for handling backup and recovery of a given application. The plug-in framework defines the following methods:

- quiesce - Method for handling quiesce for a given application plug-in
- unquiesce - Method for handling unquiesce for a given application plug-in
- discover - Method for handling discovery of storage objects for a given application plug-in
- scdump - Method for handling collection of support information, database, Operating System, and SnapDrive
- restore - Method for handling restore for a given application plug-in
- restore_pre - Method for handling pre-restore operations for a given application plug-in (can use built-in restore CLI of Snap Creator)
- restore_post - Method for handling post-restore operations for a given application plug-in (can use built-in restore CLI of Snap Creator)
- clone_pre - Method for handling pre-clone operations for a given application plug-in
- clone_post - Method for handling post-clone operations for a given application plug-in
- describe - Method for describing what a plug-in implements. This is optional for Perl plug-ins but required for native plug-ins under `plug-ins/native`.
- clone_all - Method for handling cloning for a given application plug-in (cannot use built-in cloning interface)
- clone_cleanup - Method for handling cleanup if a clone operation fails
- restore_clenaup - Method for handling cleanup if a restore operation fails
- The plug-in framework supports Perl, PowerShell, Java, UNIX Shell, and Python for programming.
- The plug-in framework enables you to implement objects and functions that exist within the Snap Creator. For example, error handling is available, which means the plug-in can use the standard implementation Snap Creator uses. This reduces the work required to create a plug-in.
- Perl plug-ins are installed under /plug-ins/<PLUG-IN-name>/<PLUG-IN>.pm.
- Native plug-ins are installed under `/plug-ins/native/plug-in.sh,plug-in.java.plug-in.bat`, and so on.
- The plug-in must be installed where it is supposed to run. This could be the Snap Creator Server or Snap Creator Agent depending on the set up of Snap Creator.

Troubleshooting Snap Creator issues

You can troubleshoot Snap Creator issues by using the information in the Snap Creator logs and Error messages.

Logs

You can use Snap Creator logs to begin troubleshooting. The logs contain information about everything Snap Creator does.

Messages can be INFO, CMD, OUTPUT, DEBUG, WARN, or ERROR. Anything with INFO is considered to be a standard, normally occurring operation. Anything with CMD is an external command or script that Snap Creator runs (according to configuration) and the return code from the command or script is logged. Typically, these are PRE, POST, or APP Quiesce/Unquiesce commands. Anything with OUTPUT is a Data ONTAP API call. Anything with DEBUG is debug information. Anything with WARN is considered to draw your attention, but, again under normal circumstances, it is considered to be normal activity and should require no action (an example is when we delete Snapshot copies). Anything with ERROR is a problem and most likely requires manual action to fix the error. Snap Creator exits on any ERROR, so it is important to fix whatever problem occurred before it runs again. Snap Creator does not automatically fix problems but you can specify Snap Creator what to do before exiting by using the PRE_EXIT_CMD defined in the configuration file.

The logs contain the output from any external commands or scripts run by Snap Creator, for example, SnapDrive. If you call other scripts through Snap Creator, it is important that you properly set up exit codes and output for those scripts. You should never exit with status 0 if a problem occurs.

The out, debug, stderr, and agent logs are retained as defined by the LOG_NUM value in the configuration file while the error log is always appended. All logs are written to the `/path/to/scServer_v<#>/logs/<profile>` directory.

The four logs for every profile and configuration are as follows:

- Out
- Debug
- Error
- Stderr

Out log

The out log contains only verbose logging information.

Debug log

The debug log contains verbose and debug logging information.

Trace messages are an extra level of debug logs which can be used by the plug-in to show trace messages. LOG_TRACE_ENABLE - `(Y|N)` Setting enables or disables trace messages.

Error log

The error log contains a history of all the ERROR events for a given configuration. The error log helps in viewing information about errors that occurred in the past so you can correlate things better and get a historical perspective. You can also monitor this log file and use it as a means to integrate Snap Creator with your monitoring application.

Stderr log

This is usually empty but contains stderr if there are any issues. This usually shows bugs in code

Snap Creator Agent

The Snap Creator Agent optionally creates logs. This is enabled by default with the following option:

SC_AGENT_LOG_ENABLE=Y

The three logs for every profile and configuration created on agent are as follows:

- Out
- Debug
- Stderr

Additionally the agent console debug can be enabled by specifying the additional `-- debug` option:

```
/path/to/scAgent_v<#>/bin/scAgent --debug
```

SCDUMP

Snap Creator collects all support information using scdump and places it into a `.zip` file located under the root Snap Creator directory. This information is useful for troubleshooting. The `.zip` file consists of the following items:

- Snap Creator version (build info, date, and so on)
- Host OS and architecture
- Database and version
- SnapDrive version
- Other environment variables

The syntax for SCDUMP is as follows:

```
./snapcreator.pl --profile profile [--config config] --action scdump -
verbose
```

Troubleshooting Snap Creator GUI error

Error starting the GUI

HTTP ERROR 503

Problem accessing /. Reason: SERVICE_UNAVAILABLE

You might receive this error message when there is no sufficient space for the temp file.

Please verify if you have sufficient space in the temp folder in the respective OS folders.

> Example: For Linux, check `/tmp`

HTTPS errors when using Snap Creator on Linux

HTTPS might not work on Linux out-of-the-box. This appears mainly to be an issue with SuSe but really could apply to any UNIX. Snap Creator does not include ssl libraries we are dependent on.

Install openssl and ensure symlinks are created correctly.

The requirements for HTTPS for Linux/Unix are as follows:

1. openssl package
2. SSL symlinks

Make sure the following symlinks are located under `/usr/lib oder /usr/lib64` (depending on if OS is 64bit or not):

- libssl.so.6
- libcrypto.so.6

If the symlinks do not exist, please cd to `/usr/lib or /usr/lib64` and run following command to link them:

- ln -sf libssl.so.0.9.8 libssl.so.6
- ln -sf libcrypto.so.0.9.8 libcrypto.so.6

Troubleshooting network issues

When authorization failures occur with Snap Creator, verify the configuration, firewall permissions, and network address translation (NAT).

IP/Hostname

Unless you use `host equiv`, the storage system name returned from the `hostname` command on the controller should be the same as that entered in the Snap Creator configuration file.

Do not use an FQDN when the host name of a storage system is abbreviated.

Ensure that the IP resolution matches the name you specified. If there is a mismatch, correct it by using `host equiv` on the storage system.

To enable host equiv, perform the following steps:

1. Enter the following command: `options https.admin.hostsequiv.enable on`

2. Edit the `/etc/hostsequiv` file and add the following: `<IP/Name of host in Snap Creator config> <Snap Creator user>`

Protection Manager

The storage controller name defined in the Snap Creator configuration parameter VOLUMES must match 1:1 with the storage controller name in Protection Manager. If they do not match, you can use the operating systems host file to force things to match 1:1.

Firewall

If there is a firewall between the host running Snap Creator and your storage system, ensure that you have ACLs (bidirectional) open for 80, 443, or both.

- 80: Used to communicate with the storage system if http is selected.
- 443: Used to communicate with the storage system if https is selected.

If the agent is running, the port on which the agent is running must be open. Ensure that the return traffic from the storage system is allowed to go to the system running Snap Creator on at least non-privileged ports.

NAT

If you use NAT, ensure that the source/destination IP addresses are not changed in the TCP packet. The host and storage systems need to know who they are talking to. Presenting a firewall IP instead of the actual host or controller IP may cause problems.

HTTPS

To use HTTPS (443) for Linux, Solaris, or AIX, install the openssl-devel RPM. This RPM contains the openssl libraries, which are required to use SSL.

Error messages

You can review the error messages associated with different Snap Creator operations.

Each error message comprises of an area code and a five digit unique identifier. For example, ERROR: [<area code>-<unique area error identifier>] <error message>. The area code identifies where the error occurs. The following is the list of different area codes:

- scf - Snap Creator Framework
- agt - Snap Creator Agent
- ora - Oracle Plug-in
- mys - MySQL Plug-in
- db2 - DB2 Plug-in
- syb - Sybase Plug-in
- ltd - Lotus Domino Plug-in
- psg - PostgreSQL Plug-in
- vmw - VMware Plug-in
- max - MaxDB Plug-in
- sme - SnapManager for Microsoft Exchange Plug-in
- sms - SnapManager for Microsoft SQL Server Plug-in
- gui - Snap Creator GUI

Snap Creator Framework error messages

Error code	Error message	Description/resolution
scf-00001	Could not get serial number - <error message>	Make sure a serial number is set or blank. Serial number when set can only be numeric. This probably means Snap Creator setup was not run. Run **snapcreator --profile setup** command.

Error code	Error message	Description/resolution
scf-00002	Couldn't Create directory <log directory>: <error message>	Log directory creation for profile failed. Make sure the user running Snap Creator has read/write access to / snapcreator/logs directory.
scf-00003	Application environment set for plug-in <plug-in name> encountered errors <error message>, proceeding with backup!	This means APP_IGNORE_ERROR is set and we are not exiting due to application errors from plug-in. Check the logs to troubleshoot problem further.
scf-00004	Couldn't redirect STDERR to <debug log name>: <error message>	STDERR is redirected to *.debug logs. Make sure user running Snap Creator has read/ write access to scServer/ logs directory.
scf-00005	The action <action> is not supported with OSSV, Exiting!	Open System SnapVault does not support all actions, use a different action.
scf-00006	Restore handling of plug-in <plug-in name> failed with exit code <exit code>, Exiting!	Restore failed due to application error. Check logs and application settings.
scf-00007	Pre restore handling of plug-in <plug-in name> failed with exit code <exit code>, Exiting!	Pre restore handling failed due to application error. Check the logs and application settings.
scf-00008	This type of restore requires SNAP_TIMESTAMP_ONLY= Y and NTAP_CONSISTENCY_GRO UP_SNAPSHOT=Y, Exiting!	Set both options and retry command.
scf-00009	Clone handling of plug-in <plug-in name> failed with exit code <exit code>, Exiting!	Cloning failed due to application error. Check logs and application settings.
scf-00010	Pre clone handling of plug-in <plug-in name> failed with exit code <exit code>, Exiting!	Pre clone handling failed due to application error, to troubleshoot check logs and application settings.

Error code	Error message	Description/resolution
scf-00011	Post clone handling of plug-in \<plug-in name\> failed with exit code \<exit code\>, Exiting!	Pose clone handling failed due to application error, to troubleshoot check logs and application settings.
scf-00012	Cloned LUN Igroup Map of \<lun clone name\> to \<igroup\> on \<controller\> failed! Exiting	The igroup map for LUN clone failed. Check error you most likely have a Manage ONTAP Solution error which may reveal the cause of the problem.
scf-00013	Indicates a ZAPI Error	Snap Creator Framework error. Indicates error is coming from Manage ONTAP Solution, to troubleshoot check error message and logs on storage controller or DataFabric Manager server.
scf-00014	PM backup list is undefined, no Backups for dataset \<data set\> exist! Exiting	Snap Creator started a backup in Protection Manager but no Snapshot copies exist. Make sure Snap Creator is registering backup and check config parameters NTAP_PM_UPDATE and NTAP_DFM_DATA_SET.
scf-00016	Protection Manager dataset List for dataset \<data set\> is undefined, check you dataset in Protection Manager! Exiting	Snap Creator determined the dataset does not exist or is empty and not setup correctly.
scf-00017	Protection Manager dataset \<data set\> was not created by snapcreator, please create dataset from within snapcreator!	The dataset must be created by Snap Creator. Datasets not created by Snap Creator are not application datasets and will not work. Please run **snapcreator --profile \<profile\> --action pmsetup** to create dataset.

Error code	Error message	Description/resolution
scf-00018	Protection Manager dataset <data set> is <conformant status>, Exiting!	This message indicates a problem with the dataset. To run a Protection Manager backup, the dataset must be conformant. Log in to Protection Manager and conform the dataset.
scf-00019	No Volumes on <controller> found! Exiting	Volumes were not found. Please check VOLUMES parameter and if Protection Manager is used ensure NTAP_DFM_DATA_SET and the dataset itself were created/configured properly.
scf-00020	SnapMirror Source VFiler <source vfiler> and vfiler specified in config <vfiler> don't match! Exiting	You have enabled vFiler tunneling by using vFiler parameter in the config file. If this is Data ONTAP 7.3.x you don't need to do vFiler tunneling. Configure source vFiler directly in VOLUMES and NTAP_USERS. If **snapmirror status** shows a secondary interface for vFiler then use SECONDARY_INTERFACES parameter to tell Snap Creator what maps to vFiler.
scf-00021	SnapMirror Source controller <source controller> and controller specified in config <controller> don't match! Exiting	Check VOLUMES and SNAPMIRROR_VOLUMES parameter, controller name should be same in both and should be the source controller.
scf-00022	SnapMirror for <controller> is not enabled, please enable snapmirror on <controller>! Exiting	Log into storage controller and setup SnapMirror properly.

Error code	Error message	Description/resolution
scf-00023	No SnapMirror Relationship for \<controller>:\<volume> exist! Exiting	Snap Creator was unable to find SnapMirror relationships for the given controller/volumes. Logon to storage controller and run a **snapmirror status** and ensure the relationships so up for given controller name. If a different name is used then you need to configure SECONDARY_INTERFACES parameter to tell Snap Creator what maps to storage controller.
scf-00024	SnapVault Source controller \<source controller> and controller specified in config \<controller> don't match! Exiting	Check VOLUMES and SNAPVAULT_VOLUMES the same source controller name and volumes should be used in both parameters.
scf-00025	SnapVault Source VFiler \<source vfiler> and vfiler specified in config \<vfiler> don't match! Exiting	You have enabled vFiler tunneling by using vFilers parameter in the config file. If this is Data ONTAP 7.3.x you don't need to do vFiler tunneling. Configure source vFiler directly in VOLUMES and NTAP_USERS. If **snapvault status** shows a secondary interface for vFiler then use SECONDARY_INTERFACES parameter to tell Snap Creator what maps to vFiler.

Error code	Error message	Description/resolution
scf-00026	No SnapVault Relationship for \<controller>:\<volume> exist! Exiting	Snap Creator was unable to find SnapVault relationships for the given controller/volumes. Logon to storage controller and run a **snapvault status** and ensure the relationships so up for given controller name. If a different name is used then you need to configure SECONDARY_INTERFACES parameter to tell Snap Creator what maps to storage controller.
scf-00027	SnapVault Status is undefined, check your configuration for \<controller>! Exiting	Snap Creator was unable to determine SnapVault status. Please check config parameters VOLUMES and SNAPVAULT_VOLUMES. Check the storage controller primary and secondary and ensure relationships exist on both end for given controller/ volumes.
scf-00028	SnapMirror Update on source \<controller>:\<volume> failed to complete in \<snapmirror wait time> minutes, Exiting!	The SnapMirror update took longer than configured wait time. You can adjust the wait time by increasing value for NTAP_SNAPMIRROR_WAIT in the config file.
scf-00029	SnapMirror Transfer Error detected - \<transfer error>! Exiting	Check error and storage controller settings for SnapMirror.
scf-00030	SnapVault Update on source \<controller>:\<volume> failed to complete in \<snapvault wait time> minutes, Exiting!	The SnapVault update took longer than configured wait time. You can adjust the wait time by increasing value for NTAP_SNAPVAULT_WAIT in the config file.

Error code	Error message	Description/resolution
scf-00031	SnapVault Transfer Error detected - <transfer error>! Exiting	Check error and storage controller settings for SnapVault.
scf-00032	Post restore handling of plug-in $ENV{'APP_NAME'} failed with exit code $result->{exit_code}, Exiting!	Post restore handling failed due to application error. Check the logs and application settings.
scf-00033	You have selected snapshot <snapshot name> for deletion but it has a dependency <snapshot dependency>, Exiting!	You have selected a Snapshot copy to delete which has a Snapshot dependency. This is not allowed by default. To override this set NTAP_SNAPSHOT_DEPEND ENCY_IGNORE=Y.
scf-00034	OSSV SnapVault status command failed with return code <exit code> and message <error message>	Open Systems SnapVault command failed, check Open Systems SnapVault logs on host.
scf-00036	Couldn't open directory <directory>	Check permissions of user running Snap Creator against directory.
scf-00037	Missing Required option --profile	The `--profile` argument is required. This is the name of your profile under `scServer/ configs`.
scf-00038	Invalid option for --action	use `snap`| `ossv`| `clone_lun`| `clone_vol` |`clone_del` | `restore`|`delete` |`snaplist`| `clonelist` |`dpstatus`| `pmsetup` |`arch`|`quiesce` | `unquiesce`|`discover` |`mount`| `umount` |`scdump`
scf-00039	Config File <config file> not found	The config file was not found. Please check the arguments `--profile` and `--config`.

Error code	Error message	Description/resolution
scf-00040	Couldn't open filehandle: <error message>	We could not open a file. This is usually a permissions problem, check the user running Snap Creator and ensure the permissions are correct.
scf-00041	PORT is a required parameter and was not defined, please check your configuration file!	The PORT parameter is a required setting, check configuration file.
scf-00042	TRANSPORT is a required parameter and was not defined, please check your configuration file!	Specify the TRANSPORT parameter in the configuration file.
scf-00043	LOG_NUM is a required parameter and was not defined, please check your configuration file!	Specify the LOG_NUM parameter in the configuration file.
scf-00044	NTAP_PWD_PROTECTION is a required parameter and was not defined, please check your configuration file!	Specify the NTAP_PWD_PROTECTION parameter in the configuration file.
scf-00045	NTAP_USERS is a required parameter and was not defined; please check your configuration file!	Specify the NTAP_USERS parameter in the configuration file.
scf-00046	VOLUMES is a required parameter and was not defined, please check your configuration file!	Specify the VOLUMES parameter in the configuration file.
scf-00047	SNAME is a required parameter and was not defined, please check your configuration file!	Specify the SNAME parameter in the configuration file.
scf-00048	Invalid application plug-in <plug-in name>, supported applications are oracle	db2

Error code	Error message	Description/resolution
scf-00049	Auto Discovery for plug-in <plug-in name> failed with exit code <exit code>, Exiting!	Application discovery failed due to application error. Check logs and application settings. In addition auto discovery can be disabled by setting APP_AUTO_DISCOVERY=N and commenting out VALIDATE_VOLUMES.
scf-00050	Auto Discovery for plug-in <plug-in name> failed because env is empty, Exiting!	The application plug-in is not supported for using auto discovery. Disable auto discovery by setting APP_AUTO_DISCOVERY=N.
scf-00051	Discovering for <plug-in name> failed with return code <exit code>	Application discovery failed due to application error. Check config and application settings. You can disable auto discovery by setting APP_AUTO_DISCOVERY=N and commenting out VALIDATE_VOLUMES.
scf-00052	Discovering discovered no storage objects, <error message>	Application discovery using VALIDATE_VOLUMES=DATA failed. Snap Creator was unable to discover any data volumes residing on storage system. To disable auto discovery comment out VALIDATE_VOLUMES.
scf-00053	Application quiesce for plug-in <plug-in name> failed with exit code <exit code>, Exiting!	Application quiesce failed due to application error. Check logs and application settings. To ignore application errors and proceed with backup you can set APP_IGNORE_ERROR=Y.

Error code	Error message	Description/resolution
scf-00054	Application unquiesce for plug-in <plug-in name> failed with exit code <exit code>, Exiting!	Application unquiesce failed due to application error. Check logs and application settings. To ignore application errors and proceed with backup you can set APP_IGNORE_ERROR=Y.
scf-00055	IBM N series Snap Creator Framework dump for plug-in <plug-in name> failed with exit code <exit code>, Exiting!	The scdump action failed due to an application error. Check the logs and application settings.
scf-00056	Couldn't write to file $scdumpFile: <error message>	The scdump action failed because Snap Creator could not create the zip archive. Check permissions on user running Snap Creator.
scf-00057	Serial number must be numeric	The serial number must be numeric. Enter numeric number or press enter to leave blank.
scf-00058	Password does not match, Exiting!	The password entered does not match, please re-enter password correctly.
scf-00059	no application object specified	Application plug-in not defined. This probably means you are running a community plug-in. If so check with plug-in developer or Snap Creator community.
scf-00060	unknown application object <application object>	Application plug-in is using unknown object. This probably means you are running a community plug-in. If so check with plug-in developer or Snap Creator community.
scf-00061	SC_AGENT has to be specified as :n";	The syntax of the SC_AGENT parameter is not correct. Check config file and set parameter to be host:port.

Error code	Error message	Description/resolution
scf-00062	SC_AGENT_TIMEOUT must be a positive, numeric value	The syntax of the SC_AGENT_TIMEOUT is not correct. Check config file and set parameter to be numeric positive value.
scf-00093	IBM N series Snap Creator Framework Agent could not be started: <error message>	The scAgent could not be started. The most likely cause is another scAgent is already running on port or something else is using port.
scf-00094	Application environment set for plug-in <plug-in name> failed <error message>, Exiting!	Failed due to application error. Check the logs to troubleshoot problem further.
scf-00095	Discovery is only supported for application plug-ins	Discovery was run but is not implemented in your application plug-in. Make sure APP_AUTO_DISCOVERY=N so we don't try and do a discover.
scf-00096	<policy> is not a defined snapshot retention policy in the configuration! Exiting	The policy you are using --policy is not valid. Please check config file and configure NTAP_SNAPSHOT_RESTENTIONS properly.
scf-00097	controller <controller> has no username or password defined in config file <config file>, Exiting!	Check NTAP_USERS and make sure user name/password is defined for storage controller.
scf-00098	LUN <lun> is either a CLONE or an actual LUN, it is not supported to perform LUN Clone(s) on LUNs that end with _CLONE, rename the LUN or use Volume Cloning!	You are trying to clone a cloned LUN which isn't supported.
scf-00099	Protection Manager backup for job-id <job id> completed with errors - <error message>	Check Protection Manager errors to find out why the backup job completed with errors.

Error code	Error message	Description/resolution
scf-00100	No SnapMirror Relationships found, check your configuration for <controller>! Exiting	Snap Creator was unable to find SnapMirror relationships for the given controller/volumes. Logon to storage controller and run a `snapmirror status` and ensure the relationships so up for given controller name. If a different name is used then you need to configure SECONDARY_INTERFACES parameter to tell Snap Creator what maps to storage controller.
scf-00101	No Snapvault Relationships found, check your configuration for <controller>! Exiting	Snap Creator was unable to find SnapVault relationships for the given controller/volumes. Log on to storage controller and run `snapvault status` and ensure the relationships are defined for given controller name. If a different name is used, you will need to configure SECONDARY_INTERFACES parameter to tell Snap Creator what maps to storage controller.
scf-00102	internal error, not all mandatory options are set for executing commands	Snap Creator is trying to execute a command but something isn't being set. Find out what CMD is being run and try using a different CMD.
scf-00104	Couldn't open plug-in dir <plug-in dir>, Exiting!	Check permissions of user running Snap Creator and ensure read/write access to `scServer/plug-ins` directory.

Error code	Error message	Description/resolution
scf-00105	Discovery is only supported for application plug-ins	Discovery is enabled but no application plug-in was specified. Check APP_NAME and if no plug-in is to be used disable discovery by setting APP_AUTO_DISCOVERY=N and commenting out VALIDATE_VOLUMES.
scf-00106	Volume <volume> on <controller> is not included in the config file.	Check the VOLUMES setting in config file and ensure the correct controller: volumes are configured.
scf-00107	Validation failed, at least one volume is not included in the config	Application discovery detected that some volumes are missing. Check which volumes are missing and add them to VOLUMES parameter so they can be included in backup.
scf-00108	Collection of OS information failed - <error message>	The scdump action failed due to error collecting operating system information. Check the logs and try running the command manually by hand.
scf-00109	Collection of SnapDrive information failed - <error message>	The scdump action failed due to error collecting SnapDrive information. Check the logs and try running the command manually by hand.
scf-00110	Couldn't create scdump zip file - <error message>	The scdump action failed because Snap Creator could not create the zip archive. Check permissions on user running Snap Creator.
scf-00111	IBM N series Snap Creator Framework dump completed with errors	The scdump action was partially successful. Check logs to determine error.

Error code	Error message	Description/resolution
scf-00112	Archive Log Deletion failed, Exiting!	Snap Creator could not delete archive logs for a given application. Check permissions where on Snap Creator user, this could be the scServer or scAgent depending on the configuration.
scf-00113	No files found under $path for controller! Exiting	Verify that the file path exists on the storage controller
scf-00114	Unknown file format for <controller> <file type> on <controller>:<volume>	A file exists which is an unknown format. This means anything other than a directory or a file. A LUN would be a file.
scf-00117	sis clone status of ID cloneID on controller failed! Exiting	Verify clone status on the storage controller.
scf-00120	Single File Restore (sis clone) on $controller:$restorePath failed! Exiting	The sis clone restore failed. Make sure you are using Data ONTAP 8.1 or greater. You can also set NTAP_SNAPSHOT_RESTORE_AUTO_DETECT=N to default to SFSR.
scf-00127	Action: mount requires the --snap_name option. To list available Snapshot copies for a give profile use the "snaplist" action	The mount option requires additional parameter --snap_name. Please add parameter and retry operation.
scf-00128	Invalid snapshot name <snapshot name> specified in --snap_name parameter, Exiting!	You didn't specify a valid Snapshot name. Run **snapcreator --profile** *profile* **--action snaplist** to see a valid list of Snapshot copies.

Error code	Error message	Description/resolution
scf-00130	End User License Agreement was not accepted, please run "./ snapcreator --profile setup" to accept the End User License Agreement	The Snap Creator Server requires acceptance of the EULA, please run **snapcreator --profile setup** and accept the EULA.
scf-00133	The <plug-in name> plug-in does not support restore from the IBM N series Snap Creator Framework. Restore must be done through the Snap Manager, Exiting!	Application plug-in does not support restore since this is an integration with SnapManager which is responsible for the application data.
scf-00134	OM_HOST is a required parameter and was not defined, please check your configuration file!	Specify the OM_HOST parameter in the configuration file.
scf-00135	OM_USER is a required parameter and was not defined, please check your configuration file!	Specify the OM_USER parameter in the configuration file.
scf-00136	OM_PWD is a required parameter and was not defined, please check your configuration file!	Specify the OM_USER parameter in the configuration file.
scf-00137	OM_PORT is a required parameter and was not defined, please check your configuration file!	Specify the OM_PORT parameter in the configuration file.
scf-00138	Action scdump is not supported with CONFIG_TYPE PLUGIN, please check your configuration file!	There are two types of config files STANDARD and PLUGIN. The PLUGIN configs only support actions quiesce, unquiesce, discover, and arch.
scf-00139	Missing options for non-interactive restore	Make sure --snap_name and --volume_name are defined they are both required parameters.

Error code	Error message	Description/resolution
scf-00140	The volume specified did not match any controller or volume specified in config	Check VOLUMES parameter in config file and ensure it is configured correctly
scf-00141	Data ONTAP Cluster-mode detected but CMODE_CLUSTER_MGMT_NAME is not configured, please check config parameter! Exiting	Check the CMODE_CLUSTER_MGMT_NAME setting in config. This is the name of the cluster mgmt LIF and is required for Cluster-Mode.
scf-00142	Discover cmode cluster nodes failed	Check to make sure CMODE_CLUSTER_MGMT_NAME is configured correctly, it should be the cluster mgmt LIF. Also check the nodes and ensure proper operation of cluster.
scf-00143	SnapVault is not supported in cmode, please set NTAP_SNAPVAULT_UPDATE to N in configuration	Check configuration and change parameter. Cmode does not support SnapVault.
scf-00144	SnapVault is not supported in cmode, please set NTAP_SNAPVAULT_SNAPSHOT to N in configuration	Check configuration and change parameter. Cmode does not support SnapVault.
scf-00145	plug-in <plug-in name> is not executable	The native or external plug-ins must have execute permissions, please check permissions on plug-in under /plug-ins directory
scf-00146	The META_DATA_VOLUME is defined but controller: volume specified does not match what is configured in VOLUMES parameter, please check configuration!	This happens if the META_DATA_VOLUME is not specified in VOLUMES. Please add to VOLUMES the meta data volume.

Error code	Error message	Description/resolution
scf-00147	Data ONTAP Cluster-mode detected but CMODE_CLUSTER_NAME is not configured correctly, please check config parameter! Exiting	The parameter CMODE_CLUSTER_NAME is required and used for ASUP and SnapMirror, please define this correctly in config file.
scf-00148	Consistency Group snapshot is not supported with the META_DATA_VOLUME option	Set NTAP_CONSISTENCY_GRO UP_SNAPSHOT=N in config when using the META_DATA_VOLUME option.
scf-00149	Protection Manager only supports timestamp snapshots, please set SNAP_TIMESTAMP_ONLY= Y	Update config file and set the SNAP_TIMESTAMP_ONLY option to Y
scf-00150	A data protection option is enabled in configuration file and IP address was detected. Please ensure no IPs are used in VOLUMES, SNAPMIRROR_VOLUMES, SNAPMIRROR_CASCADING _VOLUMES, SNAPVAULT_VOLUMES, or NTAP_DFM_DATA_SET	Check configuration file and use names instead of IP. You can set ALLOW_IP_ADDR=Y to allow IPs.
scf-00151	Mount handling of plug-in <plug-in name> failed with exit code <exit code>, Exiting!	Mount is being handled by plug-in, check for any plug-in errors or errors coming from storage system. As alternative you could set APP_DEFINED_CLONE=N and use standard SC interface for mounting Snapshot copies.

Error code	Error message	Description/resolution
scf-00152	Umount handling of plug-in <plug-in name> failed with exit code <exit code>, Exiting!	Umount is being handled by plug-in, check for any plug-in errors or errors coming from storage system. As alternative you could set APP_DEFINED_CLONE=N and use standard SC interface for mounting Snapshot copies.

Snap Creator Agent error messages

Error code	Error message	Description/Resolution
agt-00001	Port <port> is being used	The Snap Creator Agent or some other process is running on the port specified, try another port.
agt-00003	invalid parameters	The parameters given were not correct for starting the Snap Creator Agent, check the required parameters
agt-00004	Mandatory parameter 'SC_AGENT' not yet defined, aborting!	The SC_AGENT config parameter must be defined when using a remote agent.
agt-00005	Another quiesce operation or watchdog is already running on this config	You are not allowed to do back to back quiesce operations and one is already running, please wait or run unquiesce.
agt-00006	cannot create watchdog, resources are not available	The watchdog process is unable to spawn, most likely the system has reached maximum number of processes, disable watchdog in config or check OS settings.

Error code	Error message	Description/Resolution
agt-00008	Either no quiesce operation performed or forced unquiesce operation already triggered from watchdog, backup might not be useable	The quiesce and unquiesce operation did not complete and backup is only crash-consistent, please check logs to see why. This can happen if quiesce takes too long and if you are using watchdog, the watchdog process will perform a forced unquiesce after x seconds, as defined in config.
agt-00009	Agent configuration is empty, no commands are allowed to be executed remotely	PRE and POST CMDs must be allowed in the agent.conf on the agent side. Please update the agent.conf and allow necessary commands.
agt-00010	Reloading configuration from \<agent.conf\> failed with message \<message\>	The agent could not read its configuration file, please check permissions on the agent.conf file.
agt-00011	Command \<command\> is not allowed	A command was sent to the agent but is not allowed, please update agent.conf to allow command.
agt-00012	\<error message\>	This error has to do with loading a plug-in, please check the plug-in and APP_NAME setting.
agt-00013	\<error message\>	This error has to do with running the setENV method inside plug-in, please check plug-in and ensure syntax.

GUI error messages

Error code	Error message	Description/resolution
gui-00001	Unable to decrypt password - Failed to decrypt the controller password.	Make sure encrypted password in the configuration file is correct.

Error code	Error message	Description/resolution
gui-00002	Unable to encrypt password - Failed to encrypt the controller password given.	Make sure you are using the correct Snap Creator executable. Verify that `/etc/snapcreatorgui.conf` is correct.
gui-00003	Unable to get a list of log files - Failed to get the list of log files. Either log or corresponding profile folder does not exist.	Ensure that logs and corresponding profile folder exist.
gui-00004	Unable to find profiles path - Unable to find /logs/	Check if `/logs/` exists.
gui-00005	Unable to load configuration file - Configuration file corresponds to a particular profile does not exist.	Check if corresponding profile and configuration exists in the configs directory.
gui-00006	snapcreator.conf file not found - Failed to load snapcreatorgui.conf file under /gui/etc.	Try running `snapcreator profile setup`, if the `snapcreatorgui.conf` is lost.
gui-00007	Unable to update configuration file - Failed to write into particular profile config file. Same is deleted or renamed.	Check if your config is renamed or deleted.
gui-00008	Invalid username or password - Failed to login to the system. Either because of wrong username/password or not done the --profile setup	Check your user name and password and verify if you ran `snapcreator profile setup`.
gui-00009	Unable to delete file - Unable to delete profile folder or config file. File does not exist or does not have the permission to perform the operation	Check if permissions on file/folder and if they exists.
gui-00010	Unable to rename file - Unable to rename profile folder or config file. File does not exist or does not have the permission to perform the operation.	Check if permissions on file/folder and if they exists.

Error code	Error message	Description/resolution
gui-00011	Directory exists - Cannot create a new profile. Profile with same name already exists.	Choose a different profile or delete the already existing one.
gui-00012	Unable to find configs directory containing the profiles - Unable to find /configs folder	Verify if configs directory exists and if you ran snapcreator profile setup.
gui-00013	Unknown failure. Check service logs for more details - Unexpected error or RuntimeException happened. Needs to check the log for more details.	Check the logs for more information.
gui-00014	Unable to update configuration property	Close the configuration and open it again.
gui-00015	Configuration file not found.	Check if permissions on file and if they exists.
gui-00017	Unable to retrieve vCenter Datacenter information!	Check if your vCenter is correct and has a valid Datacenter.
gui-00019	Error while retrieving VM List for Datastore	Try again, as the datastore might have been deleted during retrieval.
gui-00020	Error while retrieving VM information for Datastore.	Try again, as the datastore might have been deleted during retrieval.
gui-00021	Error while retrieving Datastore List!	Try again, Verify your vCenter is correct.
gui-00022	No Datastores found!	Add Datastores to your vCenter.
gui-00023	Error while retrieving Datastore Information!	Try again, verify your vCenter.
gui-00024	Unsupported vCloud API version	The version of vCloud Director you are using is unsupported.
gui-00025	Invalid vCloud Credentials!	Enter correct credentials and try again.

Error code	Error message	Description/resolution
gui-00026	Unable to find Organizations!	Organizations not found for vCD. Create Organizations and retry.
gui-00027	Unable to Login to vCenter. Please check IP/Hostname and Login details.	Check your vCenter credentials.
gui-00028	Verify controller details/ NTAP_USERS config parameter.	Check the controller details/ NTAP_USERS.
gui-00029	Invalid vCloud Director Organization URL!	Verify the vCloud Director URL.
gui-00030	Unable to retrieve VDC List!	Check if vDCs exist for the organizations.
gui-00031	Unable to retrieve vApp List!	Check if vApps exist for the vDCs.
gui-00032	Snapshot list operation failed.	Check controller credentials and volume parameters in the configuration file.
gui-00033	File list operation failed.	Check controller credentials and volume parameters in the configuration file.
gui-00034	License verification failed.	Check controller credentials and volume parameters in the configuration file.
gui-00035	Snapshot creation failed.	Check controller credentials and volume parameters in the configuration file.
gui-00036	Failed to create recovery Snapshot.	Check controller credentials and volume parameters in the configuration file.
gui-00037	Post restore operation failed.	Check controller credentials and volume parameters in the configuration file.
gui-00038	Pre restore operation failed.	Check controller credentials and volume parameters in the configuration file.

Error code	Error message	Description/resolution
gui-00039	File restore operation failed.	Check controller credentials and volume parameters in the configuration file.
gui-00040	SIS Clone start failed.	Check controller credentials and volume parameters in the configuration file.
gui-00041	SIS Clone clear failed.	Check controller credentials and volume parameters in the configuration file.
gui-00042	Failed to get API version information.	Check controller credentials and volume parameters in the configuration file.
gui-00043	Volume restore operation failed.	Check controller credentials and volume parameters in the configuration file.
gui-00044	Only admin user can perform this operation.	You need to log in as an admin user to perform this operation,
gui-00045	User already exists.	Use a different username.
gui-00046	Admin user has access to all profiles, invalid operation!	No need to assign profiles to admin user. Admin user already has access.
gui-00047	A user can only be assigned All(Administrator) or None(ReadOnly) or a set of Other actions!	Either select just Administrator or just Read-only or a combination of other actions.
gui-00048	Admin user has access to all actions, invalid operation!	No need to assign actions to admin user. Admin user already has access.
gui-00049	Action is not allowed for this user.	Check with your administrator and request for permissions.
gui-00050	Verify Cluster details/ CMODE_CLUSTER_USERS config parameter.	Check and correct Cluster details/ CMODE_CLUSTER_USERS parameter.

Error code	Error message	Description/resolution
gui-00051	Cluster details are not valid, please verify.	Check cluster details in configuration as they seem to be invalid.
gui-00052	Controller already exists! You can update the username/ password, just by a double click.	You are adding the same controller again to the configuration, please add a new controller or update the existing one.
gui-00053.	Cluster already exists! You can update the username/password, just by a double click	You are adding the same cluster again to the configuration, please add a new controller or update the existing one.
gui-00054	No host systems found at the VCenter.	vCenter doesn't have any ESX hosts. Please add and try again.
gui-00055	ZAPI Execution IO Error!	IO error thrown by the controller.
gui-00056	ZAPI Execution protocol Error!	Protocol error was thrown by the controller.
gui-00057	ZAPI Execution API Failure Error!	API failed, check the error description in logs.
gui-00058	ZAPI Execution Authentication Error!	Invalid controller/cluster credentials
gui-00059	Error setting job monitor size, verify SNAPCREATOR_JOB_MONI TOR_SIZE entry in snapcreatorgui.conf	Correct value of SNAPCREATOR_JOB_MONI TOR_SIZE in `snapcreatorgui.conf`.
gui-00060	Error stopping job monitor, verify SNAPCREATOR_JOB_MONI TOR entry in snapcreatorgui.conf	Correct value of SNAPCREATOR_JOB_MONI TOR in `snapcreatorgui.conf`.
gui-00061	Error starting job monitor, verify SNAPCREATOR_JOB_MONI TOR entry in snapcreatorgui.conf	Correct value of SNAPCREATOR_JOB_MONI TOR in `snapcreatorgui.conf`.

Error code	Error message	Description/resolution
gui-00062	Log file not found.	Log file you are looking to download is not available on the server.
gui-00063	User session expired, please login again.	Log in again.
gui-00064	This task is already running.	You cannot run the same task again while it is already running.
gui-00065	Maximum size for Job Monitor is 1000 and minimum is 1	Set the job monitor size only between 1-1000.

Oracle Plug-in error messages

Error code	Error message	Description/resolution
ora-00001	Verifying correct version of database <db> failed	Verification failed, check ORA error and re-run sqlplus manually.
ora-00002	Database <db> is running Oracle <ver>, only 10g or higher is supported!	Oracle 8 and 9 are not supported by Snap Creator.
ora-00003	Verifying RAC status for database <db> failed	RAC check failed, check ORA error and re-run sqlplus manually.
ora-00004	Verifying archive log mode of database <db> failed	Archive log mode check failed, check ORA error and re-run sqlplus manually.
ora-00005	Database <db> is not configured in Archive Log Mode	Archive log mode must be set. Please configure db in archive log mode and restart backup.
ora-00006	Creating a backup controlfile for <db> to <control file> failed	Check permissions of directory where backup control file is being created.
ora-00007	Archive Log only backup for database <db> failed	The archive log only mode was selected and failed. The oracle plug-in will do an archive log current, look at ORA error and try running manually.

Error code	Error message	Description/resolution
ora-00008	Starting hot backup mode for database <db> failed	The hot backup mode begin sqlplus command failed, check ORA error and re-run sqlplus manually.
ora-00009	Quiescing databases finished with errors	Quiesce completed but with errors, check logs.
ora-00010	Ending hot backup mode for database <db> failed	The hot backup mode end sqlplus command failed, check ORA error and re-run sqlplus manually.
ora-00012	Unquiescing databases finished with errors	Unquiesce completed but with errors, check logs.
ora-00013	Retrieving database objects of database <db> failed	Discovery is enabled but cannot locate data files and archive logs, check ORA error and re-run sqlplus manually.
ora-00014	Discovering databases failed	Database discovery failed, check log.
ora-00015	Collection of OS information failed - <error message>	SCDUMP failed and we were unable to collect OS information, check command that was run and try running manually.
ora-00017	Collection of SnapDrive information failed - <error message>	SCDUMP failed and we were unable to collect SnapDrive information, check path to SnapDrive command and permissions.
ora-00018	Collecting Oracle information for database <db> failed	SCDUMP failed and we were unable to collect Oracle information, check ORA error and re-run sqlplus manually.
ora-00019	No SQLPLUS_CMD defined	The SQLPLUS_CMD is a required oracle plug-in config parameter.

Error code	Error message	Description/resolution
ora-00020	Oracle SQL*Plus command <sqlplus cmd> failed with return code <exit code/> and message <error message>	The sqlplus command failed check error.

MySQL plug-in error messages

Error code	Error message	Description/resolution
mys-00001	Database connection does not exist	A connection to database cannot be established, try telnet to port usually 3306, this could be local firewall or network issue.
mys-00002	Database connection problem for <db> detected	A connection to database cannot be established, try telnet to port usually 3306, this could be local firewall or network issue.
mys-00003	Quiescing databases finished with errors	Quiesce failed, please check log.
mys-00004	Database connection does not exist	A connection to database cannot be established, try telnet to port usually 3306, this could be local firewall or network issue.
mys-00006	Unquiescing databases finished with errors	Unquiesce failed, please check log.
mys-00007	SQL command <sql query> did not return any lines	The sql query didn't return output, please check for additional errors.
mys-00008	Discovering databases finished with errors	Discovery failed, please check log.
mys-00009	Collection of OS information failed - <error message>	SCDUMP failed, couldn't collect OS information, please check error and ensure OS command is specified in path.

Error code	Error message	Description/resolution
mys-00010	Collection of SnapDrive information failed - <error message>	SCDUMP failed, couldn't collect SnapDrive information, please check error and ensure SnapDrive command is specified in path.

DB2 plug-in error messages

Error code	Error message	Description/resolution
db2-00001	Quiescing database <db> failed with message <error message>	Quiesce failed for db, check error message and try running command manually.
db2-00002	Quiescing databases failed	Quiesce of databases failed, check log.
db2-00003	Unquiescing database <db> failed with message <error message>	Unquiesce failed for db, check error message and try running command manually.
db2-00004	Unquiescing databases failed	Unquiesce of databases failed, check log.
db2-00005	Retrieving database path used for database <db> failed	Discovery of database failed could not find path, check PATH settings.
db2-00007	Retrieving tablespaces for database <db> failed	Discovery could not retrieve table spaces, check database error and try running manually.
db2-00008	Retrieving tablespace containers for database <db> failed	Discovery could not retrieve table space containers, check database error and try running manually.
db2-00009	Retrieving database configuration for database <db> failed	Discovery could not retrieve database configuration, check database error and try running manually.
db2-00010	Discovering databases failed	Discovery failed, please check log.

Error code	Error message	Description/resolution
db2-00011	Collection of OS information failed - <error message>	SCDUMP failed, could not collect OS information, check command and ensure it is in PATH.
db2-00013	Collection of SnapDrive information failed - <error message>	SCDUMP failed, couldn't collect SnapDrive information, check command and ensure it is in PATH.
db2-00014	Collecting DB2 information for database <db> failed with message <error message>	SCDUMP failed, couldn't collect DB information, check database error and try running manually.

Lotus Domino plug-in error messages

Error code	Error message	Description/resolution
ltd-00001	Domino plug-in cannot work with SNAP_TIMESTAMP_ONLY = N. SNAP_TIMESTAMP_ONLY should be set to Y.	For Domino plug-in to work SNAP_TIMESTAMP_ONLY should always be set to Y in the config file. This error is displayed if SNAP_TIMESTAMP_ONLY is set to N.
ltd-00002	Quiescing databases finished with errors	Domino plug-in was unable to quiesce all the databases successfully. Check the logs to find the exact reason for the error or run snapcreator in debug mode to find the error.
ltd-00003	Unquiescing databases finished with errors	Domino plug-in was unable to unquiesce all the databases successfully. Check the logs to find the exact reason for the error or run snapcreator in debug mode to find the error.

Error code	Error message	Description/resolution
ldt-00004	Discovering databases failed	Application discovery failed due to application error. Check config and application settings. You can disable auto discovery by setting APP_AUTO_DISCOVERY=N and commenting out VALIDATE_VOLUMES.
ldt-00005	Collection of OS information failed	The scdump action failed due to error collecting OS information. Check the logs and try running the command manually by hand.
ldt-00006	Collection of SnapDrive information failed	The scdump action failed due to error collecting SnapDrive information. Check the logs and try running the command manually by hand.
ldt-00008	Restoring databases finished with errors	Domino plug-in was unable to restore all the databases successfully. Check the logs to find the exact reason for the error or run snapcreator in debug mode to find the error.
ldt-00009	Domino plug-in couldn't be loaded.	Reasons could be 1) Domino plug-in is not supported on this platform.2)Prerequisites for domino plug-in to run are not satisfied. Please check documentation(domino plug-in setup).

SnapManager for Microsoft Exchange plug-in error messages

Error code	Error message	Description/resolution
sme-00001	SME is only supported on windows operating systems	SnapManager for Microsoft Exchange is only supported on Windows.
sme-00002	Quiescing databases failed	Quiesce failed, check other error messages and log.

Error code	Error message	Description/resolution
sme-00003	Collection of OS information failed - <error message>	SCDUMP failed, could not collect operating system information, ensure operating system command is in path and check log.
sme-00004	Collection of SnapDrive information failed - <error message>	SCDUMP failed, could not collect SnapDrive information, ensure SnapDrive command is in path and check log.
sme-00005	Command <command> failed with return code <exit code> and message <error message>	The Powershell command failed, please check error message and try running manually.

SnapManager for Microsoft SQL Server plug-in error messages

Error code	Error message	Description/resolution
sms-00001	SMSQL is only supported on windows operating systems	SnapManager for Microsoft SQL Server is only supported on Windows.
sms-00002	Quiescing databases failed	Quiesce failed, check other error messages and log.
sms-00003	Collection of OS information failed - <error message>	SCDUMP failed, could not collect operating system information, ensure operating system command is in path and check log.
sms-00004	Collection of SnapDrive information failed - <error message>	SCDUMP failed, could not collect SnapDrive information, ensure SnapDrive command is in path and check log.
sms-00005	Command <command> failed with return code <exit code> and message <error message>	The Powershell command failed, please check error message and try running manually.

Sybase ASE plug-in error messages

Error code	Error message	Description/Resolution
syb-00001	SYBASE:QUIESCE: Quiescing database <db> failed, it is already quiesced!	Wait for unquiesce to complete or run an unquiesce manually.
syb-00002	SYBASE:QUIESCE: Could not get Database <db> status, ensure database is running!	Couldn't verify database, check to make sure it is running and try running command manually.
syb-00004	SYBASE:QUIESCE: Quiescing databases failed	Quiesce failed, please check log.
syb-00005	SYBVASE:UNQUIESCE: Unquiescing databases failed	Unquiesce failed, please check log.
syb-00006	SYBASE:DISCOVER: Error in running isql. Exiting	Error running isql command, check additional error information and try running command manually.
syb-00007	SYBASE:DISCOVER: Error in running isql. Exiting	Error running isql command, check additional error information and try running command manually.
syb-00008	SYBASE:DISCOVER: Error in throwing back the paths to SC_Framework	Discovery failed, couldn't send the necessary information back to framework. Check for additional errors and info in log.
syb-00009	Collection of OS information failed - <error message>	SCDUMP failed, couldn't collect OS info. Please ensure OS command is in path and check log.
syb-00010	Collection of SnapDrive information failed - <error message>	SCDUMP failed, couldn't collect SnapDrive info. Please ensure SnapDrive command is in path and check log.
syb-00012	SYBASE:RUN_CMD: Command xxxxx failed with return code <exit code> and message <error message>	A Sybase command failed, check error and try running manually.

Error code	Error message	Description/Resolution
syb-00013	SYBASE:RUN_CMD: <error message>	Generic error message, check error and log.

VMware plug-in error messages

Error code	Error message	Description/resolution
vmw-00001	Could not remove (leftover) snapshot for VM <vm_name>: <msg>>!	A SOAP error (web access) occurred while trying to call RemoveSnapshot() in VMware for a Snapshot taken as part of the backup or restore operation. Use Snapshot Manager in the vSphere Infrastructure Client to remove any Snapshot copies created that is unwanted.
vmw-00002	Could not create snapshot for VM <vm_name>!	Calling the CreateSnapshot() function in VMware did not work as expected -- either the VM cannot make a Snapshot or a vSphere error occurred. Use the vSphere Infrastructure Client to evaluate the Snapshot error condition.
vmw-00003	No IP address found for NFS Datastore <ds_name>!	The IP address associated to the NFS datastore could not be translated, meaning based on the storage controllers specified, there is no IP address on any storage controller associated to an NFS export. Verify all the appropriate storage controllers are listed in the NTAP_USERS field of the Snap Creator configuration file.

Error code	Error message	Description/resolution
vmw-00004	<remote_host> not found in storage appliance list!	The hostname and IP address associated to the NFS datastore could not be translated, meaning based on the storage controllers specified, there is no IP address on any storage controller associated to an NFS export. Verify all the appropriate storage controllers are listed in the NTAP_USERS field of the Snap Creator configuration file.
vmw-00005	No disk name found for Datastore <ds_name>!	The VIBE module could not find a disk extend associated to the VMFS datastore, which means a matching datastore to disk translation did not appear based on VMware query of the VMFS disk extent list. Verify the VMFS datastore listed in the backup has disk extents associated to it.
vmw-00006	Could not find identifying LUN on any storage appliance for VMFS datastore!	Based on a translation of LUN to VMware UUID, a matching LUN was not found. This means the LUNs on the storage controllers associated to the NTAP_USERS field do not map to this VMFS datastore. Verify all the appropriate storage controllers are listed in the NTAP_USERS field of the Snap Creator configuration file.

Error code	Error message	Description/resolution
vmw-00007	ONTAP API call lun-list-info failed: <msg>	The reported Data ONTAP API call was unsuccessful. Read the error message and contact technical support for any necessary assistance in translating the error message. The condition can normally occur in situations where RBAC is in use and the Snap Creator user on the storage controllers do not have sufficient access for the API call.
vmw-00008	ONTAP API call lun-get-serial-number failed: <msg>	The reported Data ONTAP API call was unsuccessful. Read the error message and contact technical support for any necessary assistance in translating the error message. The condition can normally occur in situations where RBAC is in use and the Snap Creator user on the storage controllers do not have sufficient access for the API call.
vmw-00009	Query of Datacenter failed: <msg>!	A SOAP error (web access) occurred while trying to query the list of DataCenter objects in VMware. Review the event logs in the vSphere Infrastructure Client to remove any Snapshot copies created that is unwanted.

Error code	Error message	Description/resolution
vmw-00010	Query of Datacenter failed!	A general vSphere API error occurred while trying to query the list of DataCenter objects in VMware. Review the event logs in the vSphere Infrastructure Client to remove any Snapshot copies created that is unwanted.
vmw-00011	Could not find entity views for Datacenter!	A general vSphere API error occurred while trying to query the Managed Object reference to a given DataCenter object in VMware. Review the event logs in the vSphere Infrastructure Client to remove any Snapshot copies created that is unwanted.
vmw-00012	Datastore <msg> not found in any Datacenter!	The datastore specified for backup is not associated to the DataCenter in the vCenter server. The VIBE module currently supports one Datacenter per vCenter server. In addition, verify the Datastore name is properly listed in the Snap Creator configuration file.
vmw-00013	<controller_name> not found in storage appliance list (private subnets for NFS Datastores?)!	The set of Snapshot locations queried through the process of collecting VMFS and NFS datastore information found a datastore that does not have an associated Snapshot location. Verify that all storage controllers are listed in the NTAP_USERS field in the Snap Creator configuration file.
vmw-00014	VIBE_TRIM_VSPHERE_NAMES format is wrong (no extra colons, semi-colons or commas allowed per entry)!	The format of the VIBE_TRIM_VSPHERE_NAMES field is incorrect. Review the format in the Snap Creator configuration file for accuracy.

Error code	Error message	Description/resolution
vmw-00015	Query of VirtualMachine object failed: <msg>!	A SOAP error (web access) occurred while trying to query a specific Virtual Machine object in VMware. Review the event logs in the vSphere Infrastructure Client to remove any Snapshot copies created that is unwanted.
vmw-00016	Query of Virtual Machine object failed!	A general vSphere API error occurred while trying to query a specific Virtual Machine object in VMware. Review the event logs in the vSphere Infrastructure Client to remove any Snapshot copies created that is unwanted.
vmw-00017	Could not get API versions from vCD: (<code>: <msg>)!	The REST API call /api/ versions to the vCloud Director failed. This call should always succeed, which may mean the vCD server specified in the Snap Creator configuration file is not correct. Verify the Snap Creator configuration file or check the vCD logs for more information.
vmw-00018	Could not get login URL in API versions results from vCD: (<code>: <msg>)!	The REST API call /api/ versions to the vCloud Director did not return a proper authentication cookie. This call should always succeed, which may mean the vCD server specified in the Snap Creator configuration file is not correct. Verify the Snap Creator configuration file or check the vCD logs for more information.

Error code	Error message	Description/resolution
vmw-00019	Could not login to vCD: (<code>: <msg>)!	The REST API call /login to the vCloud Director failed. Verify the proper user name, password and URL for the vCD and review the vCD logs for any RBAC or other error conditions.
vmw-00020	Could not get Organizations: (<code>: <msg>)!	The REST API call to list all Organizations within vCloud Director failed. Verify the proper user name, password and URL for the vCD and review the vCD logs for any RBAC or other error conditions.
vmw-00021	Could not get vDCs for Organization <organization_name>: (<code>: <msg>)!	The REST API call to query a specific Organization within vCloud Director failed. Verify the proper user name, password and URL for the vCD and review the vCD logs for any RBAC or other error conditions.
vmw-00022	Could not get vCD vApps: (<code>: <msg>)!	The REST API call to query the list of vApps associated to a vDC within vCloud Director failed. Verify the proper user name, password and URL for the vCD and review the vCD logs for any RBAC or other error conditions.
vmw-00023	Could not get vCenter data: (<code>: <msg>)!	The REST API call to collect the vCenter server associated to a given vApp within vCloud Director failed. Verify the proper user name, password and URL for the vCD and review the vCD logs for any RBAC or other error conditions.

Error code	Error message	Description/resolution
vmw-00024	Could not get vCD VMs: (<code>: <msg>)!	The REST API call to get the specific VMs associated to a vApp within vCloud Director failed. Verify the proper user name, password and URL for the vCD and review the vCD logs for any RBAC or other error conditions.
vmw-00025	No IP address for host <hostname>!	The gethostbyname() call for the specified vCenter server in the Snap Creator configuration file could not be translated. Verify the specified vCenter name can be translated to an IP address, or specify an IP address instead.
vmw-00026	Cannot ping <vcenter_name>!	The IP address associated to the vCenter server cannot be pinged via ICMP. Verify the IP address is correct, or use the VIBE_NOPING=Y field in the Snap Creator configuration file.
vmw-00027	vCenter server login failed -- invalid login!	The permissions associated to the vCenter user name or password is invalid. Verify vCenter server access with the vCenter user name and password specified in the Snap Creator configuration file.
vmw-00028	vCenter server login failed -- internal error!	A general login error occurred using the vCenter user name and password in the Snap Creator configuration file. Review event and access logs in the vSphere Infrastructure Client for more details.

Error code	Error message	Description/resolution
vmw-00029	vCenter server login failed -- check authentication and firewall settings (<msg>)!	An authentication error occurred using the vCenter user name and password in the Snap Creator configuration file. The either user name or password are likely incorrect. Review event and access logs in the vSphere Infrastructure Client for more details.
vmw-00030	Cannot ping storage appliance named <controller_name>: <msg>!	The IP address associated to the storage controller cannot be pinged via ICMP. Verify the IP address is correct, or use the VIBE_NOPING=Y field in the Snap Creator configuration file.
vmw-00031	ONTAP API connection to <controller_name> failed: <msg>!	The Data ONTAP API call system-get-info failed. If RBAC is in use, verify the user has access to the system-get-info API call. In addition, verify API access is available to the default HTTPS port for Data ONTAP API access.
vmw-00032	Storage appliance did not have network configuration information!	Execution of the Data ONTAP API call system-cli was unsuccessful, and the 'ifconfig -a' output could not be pulled from the controller. Verify network interface and Data ONTAP API network configuration information is available and correct.

Error code	Error message	Description/resolution
vmw-00033	ONTAP API inquiry snapshot-list-info on <volume_name> failed: <msg>	The reported Data ONTAP API call was unsuccessful. Read the error message and contact technical support for any necessary assistance in translating the error message. The condition can normally occur in situations where RBAC is in use and the Snap Creator user on the storage controllers do not have sufficient access for the API call.
vmw-00034	ONTAP API inquiry snapshot-list-info on <volume_name> failed: <msg>	The reported Data ONTAP API call was unsuccessful. Read the error message and contact technical support for any necessary assistance in translating the error message. The condition can normally occur in situations where RBAC is in use and the Snap Creator user on the storage controllers do not have sufficient access for the API call.
vmw-00035	Power off of virtual machine <vm_name> failed: <msg>!	A general SOAP error occurred when executing the PowerOffVM() operation in vSphere. Review the vSphere Infrastructure Client logs for details on why the operation could not be completed.
vmw-00036	Power off of virtual machine <vm_name> failed!	The vSphere PowerOffVM() call was unsuccessful. Review the vSphere Infrastructure Client logs for details on why the operation could not be completed.

Error code	Error message	Description/resolution
vmw-00037	Problem powering on VM <vm_name>: <msg>!	A general SOAP error occurred when executing the PowerOnVM() operation in vSphere. Review the vSphere Infrastructure Client logs for details on why the operation could not be completed.
vmw-00038	Problem powering on VM <vm_name>!	The vSphere PowerOnVM() call was unsuccessful. Review the vSphere Infrastructure Client logs for details on why the operation could not be completed.
vmw-00039	Could not power off vApp <vapp_name> (<code>: <msg>)!	The vCloud power off REST API operation failed. Review the vCD logs for specific reasons why the operation could not be completed.
vmw-00040	Could not power on vApp <vapp_name> (<code>: <msg>)!	The vCloud power on REST API operation failed. Review the vCD logs for specific reasons why the operation could not be completed.
vmw-00041	Failure in parsing volume path format of "<volume_path>"!	The volume path does not consist of <controller_name>:<volume_name>. Review the logs and see where the volume or storage controllers are not being translated properly.

Error code	Error message	Description/resolution
vmw-00042	ONTAP API file-list-directory-iter-next failed: <msg>	The reported Data ONTAP API call was unsuccessful. Read the error message and contact technical support for any necessary assistance in translating the error message. The condition can normally occur in situations where RBAC is in use and the Snap Creator user on the storage controllers do not have sufficient access for the API call.
vmw-00043	ONTAP API call snapshot-restore-file failed: <msg>	The reported Data ONTAP API call was unsuccessful. Read the error message and contact technical support for any necessary assistance in translating the error message. The condition can normally occur in situations where RBAC is in use and the Snap Creator user on the storage controllers do not have sufficient access for the API call.
vmw-00044	ONTAP API file-list-directory-iter-start failed: <msg>	The reported Data ONTAP API call was unsuccessful. Read the error message and contact technical support for any necessary assistance in translating the error message. The condition can normally occur in situations where RBAC is in use and the Snap Creator user on the storage controllers do not have sufficient access for the API call.

Error code	Error message	Description/resolution
vmw-00045	Timer expired on busy single-file snap restore, still running (increase VIBE_RESTORE_TIME)!	There are situations where the restore operation on the storage controller takes a very long time, either due to a busy Filesystem or a large amount of data requiring to be restored. In this case, the VIBE_RESTORE_TIME value in the Snap Creator configuration file must be increased to allow for a longer restoration period.
vmw-00046	ONTAP API call license-list-info failed: <msg>	The reported Data ONTAP API call was unsuccessful. Read the error message and contact technical support for any necessary assistance in translating the error message. The condition can normally occur in situations where RBAC is in use and the Snap Creator user on the storage controllers do not have sufficient access for the API call.
vmw-00047	ONTAP API call volume-clone-create failed: <msg>	The reported Data ONTAP API call was unsuccessful. Read the error message and contact technical support for any necessary assistance in translating the error message. The condition can normally occur in situations where RBAC is in use and the Snap Creator user on the storage controllers do not have sufficient access for the API call.

Error code	Error message	Description/resolution
vmw-00048	ONTAP API call lun-create-clone failed: <msg>	The reported Data ONTAP API call was unsuccessful. Read the error message and contact technical support for any necessary assistance in translating the error message. The condition can normally occur in situations where RBAC is in use and the Snap Creator user on the storage controllers do not have sufficient access for the API call.
vmw-00049	ONTAP API call volume-offline failed: <msg>	The reported Data ONTAP API call was unsuccessful. Read the error message and contact technical support for any necessary assistance in translating the error message. The condition can normally occur in situations where RBAC is in use and the Snap Creator user on the storage controllers do not have sufficient access for the API call.
vmw-00050	ONTAP API call volume-destroy failed: <msg>	The reported Data ONTAP API call was unsuccessful. Read the error message and contact technical support for any necessary assistance in translating the error message. The condition can normally occur in situations where RBAC is in use and the Snap Creator user on the storage controllers do not have sufficient access for the API call.

Error code	Error message	Description/resolution
vmw-00051	ONTAP API call lun-destroy failed: <msg>	The reported Data ONTAP API call was unsuccessful. Read the error message and contact technical support for any necessary assistance in translating the error message. The condition can normally occur in situations where RBAC is in use and the Snap Creator user on the storage controllers do not have sufficient access for the API call.
vmw-00052	ONTAP API call lun-online failed: <msg>	The reported Data ONTAP API call was unsuccessful. Read the error message and contact technical support for any necessary assistance in translating the error message. The condition can normally occur in situations where RBAC is in use and the Snap Creator user on the storage controllers do not have sufficient access for the API call.
vmw-00053	ONTAP API call lun-map-list-info failed: <msg>	The reported Data ONTAP API call was unsuccessful. Read the error message and contact technical support for any necessary assistance in translating the error message. The condition can normally occur in situations where RBAC is in use and the Snap Creator user on the storage controllers do not have sufficient access for the API call.

Error code	Error message	Description/resolution
vmw-00054	Initiators for LUN <lun_name> do not exist!	The LUN with the appropriate UUID mapped to a vSphere host does not have any initiator groups associated to the LUN, which means the Datastore may have either been unmapped or removed in the middle of a restore operation. Verify the LUN IDs on the storage controller are unique and that there are no forced mounts of duplicate datastores in the vSphere environment.
vmw-00055	ONTAP API call lun-map failed: <msg>	The reported Data ONTAP API call was unsuccessful. Read the error message and contact technical support for any necessary assistance in translating the error message. The condition can normally occur in situations where RBAC is in use and the Snap Creator user on the storage controllers do not have sufficient access for the API call.
vmw-00056	Storage query of host system <esx_host_name> failed: <msg>!	Execution of the RefreshStorageSystem() vSphere API call failed due to a general SOAP error (web services). Verify connectivity to the vCenter server and proper vSphere host and cluster configuration within the vSphere environment where the VM restore is taking place.

Error code	Error message	Description/resolution
vmw-00057	Storage query of host system <esx_host_name> failed!	Execution of the RefreshStorageSystem() vSphere API call failed to the vCenter server. Verify connectivity to the vCenter server and proper vSphere host and cluster configuration within the vSphere environment where the VM restore is taking place.
vmw-00058	Rescan of VMFS file systems on host system <esx_host_name> failed: <msg>!	Execution of the RescanVmfs() vSphere API call failed due to a general SOAP error (web services). Verify connectivity to the vCenter server and proper vSphere host and cluster configuration within the vSphere environment where the VM restore is taking place.
vmw-00059	Rescan of VMFS file systems on host system <esx_host_name> failed!	Execution of the RescanVmfs() vSphere API call failed to the vCenter server. Verify connectivity to the vCenter server and proper vSphere host and cluster configuration within the vSphere environment where the VM restore is taking place.
vmw-00060	ONTAP API call snapshot-create failed: <msg>	The reported Data ONTAP API call was unsuccessful. Read the error message and contact technical support for any necessary assistance in translating the error message. The condition can normally occur in situations where RBAC is in use and the Snap Creator user on the storage controllers do not have sufficient access for the API call.

Error code	Error message	Description/resolution
vmw-00061	ONTAP API call snapshot-delete failed: <msg>	The reported Data ONTAP API call was unsuccessful. Read the error message and contact technical support for any necessary assistance in translating the error message. The condition can normally occur in situations where RBAC is in use and the Snap Creator user on the storage controllers do not have sufficient access for the API call.
vmw-00062	vCenter validation of session failed: <msg>!	A SOAP error occurred when refreshing the vSphere session to the vCenter server. This is called after a restore operation, primarily for situations where a long restore operation is taking place and the connection to the vCenter server times out. Verify the timeout values in the vCenter server or ensure proper network connectivity to the vCenter server.
vmw-00063	vCenter validation of session failed!	A general error occurred when refreshing the vSphere session to the vCenter server. This is called after a restore operation, primarily for situations where a long restore operation is taking place and the connection to the vCenter server times out. Verify the timeout values in the vCenter server or ensure proper network connectivity to the vCenter server.

Error code	Error message	Description/resolution
vmw-00064	vCenter view validation of session failed: <msg>!	A SOAP error occurred when refreshing the session manager Managed Object view of the vSphere session to the vCenter server. This is called after a restore operation, primarily for situations where a long restore operation is taking place and the connection to the vCenter server times out. Verify the timeout values in the vCenter server or ensure proper network connectivity to the vCenter server.
vmw-00065	vCenter view validation of session failed!	A general error occurred when refreshing the session manager Managed Object view of the vSphere session to the vCenter server. This is called after a restore operation, primarily for situations where a long restore operation is taking place and the connection to the vCenter server times out. Verify the timeout values in the vCenter server or ensure proper network connectivity to the vCenter server.
vmw-00066	vCenter new login failed -- invalid login!	Creation of a new vCenter session after a long restore operation has failed. Verify the timeout values in the vCenter server or ensure proper network connectivity to the vCenter server. This should normally not occur unless someone is changing the vCenter configuration and authentication during an active restore operation.

Error code	Error message	Description/resolution
vmw-00067	vCenter new login failed -- internal error!	Creation of a new vCenter session after a long restore operation has failed. Verify the timeout values in the vCenter server or ensure proper network connectivity to the vCenter server. This should normally not occur unless someone is changing the vCenter configuration and authentication during an active restore operation and is even more unique in that the vSphere API call has come back with an undefined error condition.
vmw-00068	vCenter new login failed -- check authentication and firewall settings!	The permissions associated to the vCenter user name and password is invalid. Verify vCenter server access with the vCenter user name and password specified in the Snap Creator configuration file. This would only happen if there is an active restore, a timeout has occurred to the vCenter server and the authentication parameters to the vCenter server for the user have changed.
vmw-00069	Query of host systems failed: <msg>!	A SOAP error (web access) occurred while trying to query a specific Host System object in vSphere during a restore operation on an NFS datastore. Review the event logs in the vSphere Infrastructure Client to remove any Snapshot copies created that is unwanted.

Error code	Error message	Description/resolution
vmw-00070	Query of host systems failed!	A general occurred while trying to query a specific Host System object in vSphere during a restore operation on an NFS datastore. Review the event logs in the vSphere Infrastructure Client to remove any Snapshot copies created that is unwanted.
vmw-00071	Could not find entity views for HostSystem!	When querying for host systems associated to the vCenter server, no hosts came back as connected to the vCenter server. This is a highly improbable error -- verify connectivity to the vCenter server and proper configuration of host systems through the vSphere Infrastructure Client.
vmw-00072	No host system with Datastore named <datastore_name> found!	The datastore specified for restore does not show up on any host system in vSphere. This is highly unlikely to occur unless the Datastore is disconnected in the middle of a restore operation. Verify connectivity to the vCenter server and proper configuration of host systems through the vSphere Infrastructure Client.

Error code	Error message	Description/resolution
vmw-00073	Query of host system view failed: \<msg\>!	Collection of the entity view of the Host System specified for restore where the original VMFS datastore is found could not be executed to the vCenter server. Given the restore host system has already been uncovered, this query should always be successful unless there is a connectivity problem or a vSphere host is put into maintenance mode during a restore operation. Verify connectivity to the vCenter server and proper configuration of host systems through the vSphere Infrastructure Client.
vmw-00075	Could not find entity views for host system!	Query of the entity view on the restore host could not be executed to the vCenter server. Given the restore host system has already been uncovered, this query should always be successful unless there is a connectivity problem or a vSphere host is put into maintenance mode during a restore operation. Verify connectivity to the vCenter server and proper configuration of host systems through the vSphere Infrastructure Client.

Error code	Error message	Description/resolution
vmw-00076	Could not find new Datastore to copy VMs from!	Discovery of the new VMFS datastore that has been cloned, mapped and rescanned to the restore host has failed. This means that despite multiple HBA and VMFS rescans, mapping of the cloned LUN associated to the VMFS datastore and refreshing of the restore host, the new Datastore was still not shown. Verify advanced options settings with the vSphere host, make sure resignatured VMFS volumes can be discovered, verify connectivity to the vCenter server and validate proper configuration of host systems through the vSphere Infrastructure Client.
vmw-00077	vCenter validation of session failed: <msg>!	A query of the session manager in the vCenter server object failed due to a SOAP error (web services). Verify the connection to the vCenter server has not timed out.
vmw-00078	vCenter validation of session failed!	A query of the session manager in the vCenter server object failed. Verify the connection to the vCenter server has not timed out.
vmw-00079	CopyDatastoreFile() on Datastore <datastore_name> failed: <msg>!	Data cannot be copied from the VMFS datastore Snapshot into the original Datastore for the VM. The <msg> output will outline why the VMware API call failed. Verify proper configuration and permissions to the Datastore folder through the vSphere Infrastructure Client.

Error code	Error message	Description/resolution
vmw-00080	Problem reverting to VM snapshot for <vm_name>: <msg>!	A SOAP error (web access) occurred while trying to execute the RevertToCurrentSnapshot() on a VM in vSphere during a restore operation on a VMFS datastore. Review the event logs in the vSphere Infrastructure Client to remove any Snapshot copies created that is unwanted.
vmw-00081	Problem reverting VM snapshot for <vm_name>!	A general error occurred while trying to execute the RevertToCurrentSnapshot() on a VM in vSphere during a restore operation on a VMFS datastore. Review the event logs in the vSphere Infrastructure Client to remove any Snapshot copies created that is unwanted.
vmw-00082	Could not clear LUN -- LUN/ volume clone must be cleared manually!	The LUN or volume clone associated to the restore of a VM on a VMFS Datastore could not be taken offline or destroyed. If FlexClone licensing exists on the storage controller, it is the volume clone that cannot be taken offline or destroyed. If a LUN clone was created, the cloned LUN cannot be taken offline or destroyed. Review the storage controller event messages for errors related to the ONTAP API calls.

Error code	Error message	Description/resolution
vmw-00083	Could not destroy temporary snapshot -- may need manual cleanup!	The VIBE restores Snapshot copies created as part of the restore process cannot be removed. The storage controller Snapshot on the volume where the Datastore was created must be removed manually.
vmw-00084	Restore operation of VM files failed -- reverting to original contents!	The single-file snap restore (SFSR) operation on the storage controller failed. There will generally be another error message in the Snap Creator log displaying exactly why the SFSR operation did not complete. Look for timeout conditions, space availability or vSphere refresh times for more clues as to why the SFSR operation did not complete.
vmw-00085	Restore operation of VM files failed -- confirm contents of VM directory!	If the first SFSR restore operation on the NFS Datastore did not complete, and the second SFSR restoring back to the VIBE restore Snapshot also fails, this message appears. Review storage controller and Snap Creator logs for more detailed messages as to why the SFSR operations are not completing.
vmw-00086	Problem reverting to VM snapshot for <vm_name>: <msg>!	A SOAP error (web access) occurred while trying to execute the RevertToCurrentSnapshot() on a VM in vSphere during a restore operation on an NFS datastore. Review the event logs in the vSphere Infrastructure Client to remove any Snapshot copies created that is unwanted.

Error code	Error message	Description/resolution
vmw-00087	Problem reverting VM snapshot for <vm_name>!	A general error occurred while trying to execute the RevertToCurrentSnapshot() on a VM in vSphere during a restore operation on an NFS datastore. Review the event logs in the vSphere Infrastructure Client to remove any Snapshot copies created that is unwanted.
vmw-00088	Could not destroy temporary snapshot -- may need manual cleanup!	The VIBE restore Snapshot, created as part of the restore process cannot be removed. The storage controller Snapshot on the volume where the Datastore was created must be removed manually.
vmw-00089	Could not find matching storage appliance for vCenter/ Datastore pair!	If the storage does not appear in an internal list based on a vCenter and Datastore pair internally to VIBE, then the list was improperly configured based on data collection of existing vSphere and vCloud objects. Review the logs and Snap Creator configuration files and ensure all parameters are properly defined and no other errors appear in the Snap Creator log files.
vmw-00090	Restore snapshot <restore_snapshot_name> does not exist on storage appliance <controller_name>, volume <volume_name>!	The Snapshot copy specified with the `--snap_name` option does not exist for the volume and storage controller listed. Confirm the spelling and existence of the Snapshot copy being restored.

Error code	Error message	Description/resolution
vmw-00091	Could not query state information on restore snapshot <restore_snapshot_name>!	The Data ONTAP API call snaphost-list-info failed -- look in the Snap Creator log for other error messages indicating why the Data ONTAP API call failed.
vmw-00092	Restore snapshot <restore_snapshot_name> is in a busy state -- select a different snapshot!	VIBE requires that the Snapshot copy being used for restore purposes on the storage controller not be busy -- it cannot be part of a clone or be busy according to the status on the storage controller. Running snap list on the storage controller and looking at the state of the Snapshot copy in the volume where the Datastore is located will indicate whether the Snapshot copy is busy, and why.
vmw-00093	Restoring of VM(s) on Datastore <datastore_name> failed!	This is a general failure message - look for other error messages for specific failure conditions.
vmw-00094	VIBE_VCENTER_USER not defined!	The VIBE_VCENTER_USER field in the Snap Creator configuration file must always be defined. Check the Snap Creator configuration file and make sure the value is defined and not commented out.
vmw-00095	VIBE_VCENTER_PASSWD not defined!	The VIBE_VCENTER_PASSWD field in the Snap Creator configuration file must always be defined. Check the Snap Creator configuration file and make sure the value is defined and not commented out.

Error code	Error message	Description/resolution
vmw-00096	VIBE_VCLOUD_USER not defined!	The VIBE_VCLOUD_USER field in the Snap Creator configuration file must always be defined when the VIBE_VCLOUD_NAMES configuration option is being used. Check the Snap Creator configuration file and make sure the value is defined and not commented out.
vmw-00097	VIBE_VCLOUD_PASSWD not defined!	The VIBE_VCLOUD_PASSWD field in the Snap Creator configuration file must always be defined when the VIBE_VCLOUD_NAMES configuration option is being used. Check the Snap Creator configuration file and make sure the value is defined and not commented out.
vmw-00098	ACTION not defined!	The action field must be defined. This generally happens through use of the `--action` option when executing Snap Creator. Verify proper command line use of Snap Creator.
vmw-00100	USER_SNAP_NAME not defined (use --snap_name <snapshot name>)!	When performing a restore operation, the Snapshot name must be specified on the command line or through execution in the GUI in order to know which Snapshot to perform the restore from. Verify the Snap Creator command line for proper syntax.

Error code	Error message	Description/resolution
vmw-00101	VIBE_VCLOUD_NAMES format is wrong (no extra colons, semi-colons or commas allowed per Org entry)!	The format of VIBE_VCLOUD_NAMES must be defined based on the format specified in the comments of the Snap Creator configuration file. If any Organizations, vDCs or vApps have colons in the names, or any objects within vSphere use colons, please use different naming conventions so that parsing of VIBE_VCLOUD_NAMES will work properly.
vmw-00102	Organization field must be defined for each VIBE_VCLOUD_NAMES entry!	When defining a new backup set within a Snap Creator configuration file, the Organization field must always be specified. Verify the VIBE_VCLOUD_NAMES syntax in the Snap Creator configuration file.
vmw-00103	VIBE_VSPHERE_NAMES format is wrong (no extra colons, semi-colons or commas allowed per vCenter entry)!	The format of VIBE_VSPHERE_NAMES must be defined based on the format specified in the comments of the Snap Creator configuration file. If any vCenters, Datastores or VMs have colons in the names, please use different naming conventions so that parsing of VIBE_VCLOUD_NAMES will work properly.

Error code	Error message	Description/resolution
vmw-00104	vCenter field must be defined for each VIBE_VSPHERE_NAMES entry!	When defining a new backup set within a Snap Creator configuration file, the vCenter field must always be specified. Verify the VIBE_VSPHERE_NAMES syntax in the Snap Creator configuration file.
vmw-00105	VIBE_VMWARE_SNAPSHOT must be set to Y or N!	This value must be either Y (the default) or 'N' to specify not to take VMware Snapshot copies.
vmw-00106	NTAP_USERS value must be \<ip>:\<user>/\<passwd> pairs (separated by semi-colons)!	Check the NTAP_USERS value in the Snap Creator configuration file for proper syntax and format.
vmw-00107	NTAP_USERS value must be \<ip>:\<user>/\<passwd> pairs (separated by semi-colons)!	Check the NTAP_USERS value in the Snap Creator configuration file for proper syntax and format.
vmw-00108	Could not create snapshot for VM \<vm_name>!	The VM Snapshot creation process failed. There will be another error message in the log indicating the failure. Review the vSphere Infrastructure Client logs for VMware error messages.
vmw-00109	Snapshot creation process was NOT completed successfully!	At least one of the VMs where Snapshot copies were being created did not execute properly. Review the Snap Creator and vSphere Infrastructure Client logs for error messages.
vmw-00110	Could not remove snapshot for VM \<vm_name>!	The VM snapshot removal process failed. There will be another error message in the log indicating the failure. Review the vSphere Infrastructure Client logs for VMware error messages.

Error code	Error message	Description/resolution
vmw-00111	Snapshot removal process was NOT completed successfully!	At least one of the VMs where Snapshot copies were being removed did not execute properly. Review the Snap Creator and vSphere Infrastructure Client logs for error messages.
vmw-00112	Collection of OS information failed: <msg>!	The scdump() function used for support debugging requires collection of OS information. The internal request to check the operating system version did not succeed. Review the Snap Creator logs for information as to why the error occurred.
vmw-00113	Collection of OS information failed: <msg>!	The scdump() function used for support debugging requires collection of OS information. The internal request to check the operating system version did not succeed. Review the Snap Creator logs for information as to why the error occurred.
vmw-00114	NTAP_PM_UPDATE value set from VOLUMES environment variable has an invalid number of array items!	Check the NTAP_PM_UPDATE value in the Snap Creator configuration file for proper syntax and format.
vmw-00115	No datastore systems available on vSphere host <esx_host_name>!	The datastore system associated to the vSphere session context is invalid. Check that the vSphere host used for restores is operational and not in maintenance mode. Review the vSphere Infrastructure Client logs for more information about the vSphere host status.

Error code	Error message	Description/resolution
vmw-00116	No storage systems available on vSphere host <esx_host_name>!	The storage system associated to the vSphere session context is invalid. Check that the vSphere host used for restores is operational and not in maintenance mode. Review the vSphere Infrastructure Client logs for more information about the vSphere host status.
vmw-00117	Collection of datastore systems for vSphere host failed: <msg>!	The datastore system associated to the vSphere session context does not have any managed object reference. Check that the vSphere host used for restores is operational and not in maintenance mode. Review the vSphere Infrastructure Client logs for more information about the vSphere host status.
vmw-00118	Collection of storage systems for vSphere host failed: <msg>!	The storage system associated to the vSphere session context does not have any managed object reference. Check that the vSphere host used for restores is operational and not in maintenance mode. Review the vSphere Infrastructure Client logs for more information about the vSphere host status.
vmw-00119	Scan of unresolved VMFS volumes for vSphere host <esx_host_name> failed!	The QueryUnresolvedVmfsVolumes() vSphere API call on the host system failed. Review the vSphere Infrastructure Client logs for more information about the vSphere host status.

Error code	Error message	Description/resolution
vmw-00120	Resignature of unresolved VMFS volumes on vSphere host failed: <msg>!	The ResolveMultipleUnresolvedVmfsVolumes() vSphere API call on the host system failed. Review the vSphere Infrastructure Client logs for more information about the vSphere host status.
vmw-00121	Failure in file-list-directory-iter-start: <msg>!	The reported Data ONTAP API call was unsuccessful. Read the error message and contact technical support for any necessary assistance in translating the error message. The condition can normally occur in situations where RBAC is in use and the Snap Creator user on the storage controllers do not have sufficient access for the API call.
vmw-00122	Could not remove (leftover) snapshot for VM <vm_name>!	A SOAP error (web access) occurred while trying to call RemoveSnapshot() in VMware for a snapshot taken as part of the backup or restore operation. Use Snapshot Manager in the vSphere Infrastructure Client to remove any snapshot created that is unwanted.
vmw-00123	Storage query of host system <esx_host_name> failed: <msg>!	Execution of the RescanAllHba() vSphere API call failed due to a general SOAP error (web services). Verify connectivity to the vCenter server and proper vSphere host and cluster configuration within the vSphere environment where the VM restore is taking place.

Error code	Error message	Description/resolution
vmw-00124	Storage query of host system <esx_host_name> failed!	Execution of the RescanAllHba() vSphere API call failed to the vCenter server. Verify connectivity to the vCenter server and proper vSphere host and cluster configuration within the vSphere environment where the VM restore is taking place.
vmw-00125	vCenter view validation of session failed: <msg>!	A query of the file manager in the vCenter server object failed due to a SOAP error (web services). Verify the connection to the vCenter server has not timed out.
vmw-00126	vCenter view validation of session failed!	A query of the file manager in the vCenter server object failed. Verify the connection to the vCenter server has not timed out.
vmw-00127	Query of VirtualMachine object failed: <msg>!	Collection of the entity view of the VirtualMachine during the VM iteration process could not be executed to the vCenter server. This is specifically for when vCloud objects are re-translated to VM objects in vSphere. Verify connectivity to the vCenter server and proper configuration of host systems through the vSphere Infrastructure Client and that the vCenter IP address is correct.

Error code	Error message	Description/resolution
vmw-00128	Query of VirtualMachine object failed!	Collection of the entity view of the VirtualMachine during the VM iteration process could not be executed to the vCenter server. This is specifically for when vCloud objects are re-translated to VM objects in vSphere. Verify connectivity to the vCenter server and proper configuration of host systems through the vSphere Infrastructure Client and that the vCenter IP address is correct.
vmw-00129	Power off condition of vApp <vm_name> unknown: (<num>: <msg>)!	When the vApp powerOff REST API is executed, the REST return status indicates an unknown condition. The powerOff call should always return a Task or Error, so it means a third condition of unknown type was returned. Check with VMware on the possible return codes for vCloud powerOff API operations.
vmw-00130	Power on condition of vApp <vm_name> unknown: (<num>: <msg>)!	When the vApp powerOn REST API is executed, the REST return status indicates an unknown condition. The powerOn call should always return a Task or Error, so it means a third condition of unknown type was returned. Check with VMware on the possible return codes for vCloud powerOn API operations.

Error code	Error message	Description/resolution
vmw-00131	Could not power off vApp <vm_name> unknown: (<num>: <msg>)!	When the vApp powerOff REST API is executed, the REST return status indicates an error condition. Review the error code for information about the failure, and check with VMware on the possible return codes for vCloud powerOff API operations.
vmw-00132	Could not power on vApp <vm_name> unknown: (<num>: <msg>)!	When the vApp powerOn REST API is executed, the REST return status indicates an error condition. Review the error code for information about the failure, and check with VMware on the possible return codes for vCloud powerOn API operations.

Error code	Error message	Description/resolution
vmw-00133	Scan for unresolved VMFS volumes did not find any entries!	This condition occurs when VMware is unable to see new Datastores listed in the vSphere environment during restore operations. The sequence of events is to clone, map and online the new LUN associated to the VMFS datastore being restored on the identified ESX host. Once this is done, the vSphere API call QueryUnresolvedVmfsVolumes() is called to find unresolved VMFS volumes not currently mapped to a datastore or resigned on the ESX host. Essentially, the API call returned no new entries, which means VMware does not see the new LUN. Check the existing vSphere configuration to determine if new Datastores can be provisioned on the restore ESX host, as well as check with VMware on the condition of the ESX host when new Datastores are connected.
vmw-00134	Collection of storage systems for vSphere host failed: <msg>!	This condition occurs when the vSphere API call QueryUnresolvedVmfsVolumes() fails on the ESX host identified for restore. Check the existing vSphere configuration to determine if new Datastores can be provisioned on the restore ESX host, as well as check with VMware on the condition of the ESX host when new Datastores are connected.

Error code	Error message	Description/resolution
vmw-00135	Could not remove snapshot(s) for VM <vm_name>!	Snap Creator deletes VM Snapshot copies on VMs about to be restored before starting the restore process. It is called to remove leftover Snapshot copies if any exist. If this operation fails, it means Snap Creator has found leftover VM Snapshot copies (created by Snap Creator) that it cannot delete. Delete these VM Snapshot copies manually before attempting the restore operation.
vmw-00136	No snapshot named <snapshot_name> found for VM <vm_name>!	When attempting to remove VM Snapshot copies, the remove function could not find a Snap Creator created VM snapshot. Verify the existing VMware Snapshot copies and also ensure two Snap Creator backup jobs of the same VM objects are not taking place at the same time.
vmw-00137	Restore process had errors and did not complete successfully!	The restore operation failed. Look for additional vmw-<num> errors in the log output for more details as to what failed during the restore process.

Error code	Error message	Description/resolution
vmw-00138	No root snapshot list found for VM <vm_name>!	When attempting to remove VM Snapshot copies, the remove function could not find a Snap Creator created VM snapshot. In addition, there were no Snapshot copies (period) for the VM. There is no root Snapshot list when this error occurs. Verify the existing VMware Snapshot copies and also ensure two Snap Creator backup jobs of the same VM objects are not taking place at the same time.

Snap Creator examples

Snap Creator enables you to perform simple procedures such as creating a Snapshot copy as well as complex procedures such as SnapMirror destination volume.

Snapshot copy

This example uses Snap Creator to create a consistent Snapshot copy. Because a Snapshot copy is the basis for all operations, all examples require the following settings:

Configuration option	Setting
SNAME	Snapshot copy name
VOLUMES	controller1:vol1,vol2,vol3
NTAP_USERS	controller1:snapadm/mypassword
TRANSPORT	HTTP
PORT	80
LOG_NUM	10
NTAP_PWD_PROTECTION	N
NTAP_SNAPSHOT_RETENTIONS	daily:7

Run Snap Creator with the following options:

```
./snapcreator --profile profile_name --action snap --policy daily
optional_arguments
```

These settings are always required. In this example, we have created only one retention policy set to daily, which retains seven Snapshot copies.

Application-consistent backup

This example combines an application quiesce and unquiesce with a Snapshot copy.

Configuration option	Setting
APP_NAME	oracle|db2|mysql|<plug-in>
APP_IGNORE_ERROR	N
APP_DEFINED_RESTORE	N
APP_AUTO_DISCOVERY	N

Configuration option	Setting
APP_CONF_PERSISTENCE	Y

Run Snap Creator with the following options:

```
./snapcreator --profile profile_name --action snap --policy policy_name
optional_arguments
```

Snapshot copy and backup to tape

This example uses Snap Creator to create and clone a Snapshot copy, mount this clone, and then back up the mount point to tape by using third-party backup software.

Configuration option	Setting
NTAP_CLONE_FOR_BACKUP	Y
NTAP_CLONE_SECONDARY	N
NTAP_CLONE_IGROUP_MAP	controller1:src_volume1/igroup1
NTAP_VOL_CLONE_RESERVE	none
NTAP_NUM_VOL_CLONES	1
NTAP_LUN_CLONE_RESERVATION	false
PRE_NTAP_CLONE_DELETE_CMD1	Mount script or SnapDrive command
PRE_NTAP_CLONE_DELETE_CMD2	CLI command to start backup of mount point

To clone a volume, run Snap Creator with the following options:

```
./snapcreator --profile profile_name --action clone_vol --policy
policy_name optional_arguments
```

To clone a LUN, run Snap Creator with the following options:

```
./snapcreator --profile profile_name --action clone_lun --policy
policy_nameoptional_arguments
```

Backup to disk (Open Systems SnapVault)

This example uses the Open Systems SnapVault client to perform a SnapVault update or create a Snapshot copy on the secondary storage.

Configuration option	Setting
NTAP_OSSV_ENABLE	Y
NTAP_OSSV_HOMEDIR	/usr/snapvault

Configuration option	Setting
NTAP_OSSV_FS_SNAPSHOT	N

Run Snap Creator with the following options:

```
./snapcreator --profile profile_name --action ossv --policy policy_name
optional_arguments
```

Snapshot copy and backup to disk (SnapVault)

This example uses Snap Creator to create a Snapshot copy, perform a SnapVault update, and create a Snapshot copy of the SnapVault secondary.

Configuration option	Setting
SNAPVAULT_VOLUMES	controller1:vol1,vol2,vol3
NTAP_SNAPVAULT_RETENTIONS	Daily:30
NTAP_SNAPVAULT_RETENTION_AGE	30
NTAP_SNAPVAULT_MAX_TRANSFER	kbps or blank
NTAP_SNAPVAULT_UPDATE	Y
NTAP_SNAPVAULT_WAIT	minutes
NTAP_SNAPVAULT_NODELETE	N

Run Snap Creator with the following options:

```
./snapcreator --profile profile_name --action snap --policy policy_name
optional_arguments
```

Snapshot copy and backup to disk (SnapMirror)

This example uses Snap Creator to create a Snapshot copy and perform a SnapMirror update.

Configuration option	Setting
SNAPMIROR_VOLUMES	controller1:vol1,vol2,vol3
NTAP_SNAPMIRROR_USE_SNAPSHOT	Y
NTAP_SNAPMIRROR_MAX_TRANSFER	kbps or blank
NTAP_SNAPMIRROR_UPDATE	Y

Run Snap Creator with the following options:

```
./snapcreator --profile profile_name --action snap --policy policy_name
optional_arguments
```

Snapshot copy and database refresh (primary)

This example uses Snap Creator to create and clone a Snapshot copy.

Configuration option	Setting
NTAP_CLONE_FOR_BACKUP	Y
NTAP_CLONE_IGROUP_MAP	controller1:src_volume1/igroup1
NTAP_VOL_CLONE_RESERVE	none
NTAP_LUN_CLONE_RESERVATION	false
NTAP_NFS_EXPORT_HOST	hostname
NTAP_NFS_EXPORT_ACCESS	root
NTAP_NFS_EXPORT_PERSISTENT	True
MOUNT_CMD01	Mount script or SnapDrive command to mount clone
MOUNT_CMD02	CLI command or script to start cloned database
UMOUNT_CMD01	Mount script or SnapDrive command to umount clone

To clone a volume, run Snap Creator with the following options:

```
./snapcreator --profile profile_name --action clone_vol --snap_name
snapshot name --policy policy_name optional_arguments
```

To clone a LUN, call Snap Creator with the following options:

```
./snapcreator --profile profile_name --action clone_lun --policy
policy_nameoptional_arguments
```

Snapshot copy and database refresh (secondary)

This example uses Snap Creator to create a Snapshot copy, perform a SnapMirror update, and clone the SnapMirror destination volume.

Configuration option	Setting
SNAPMIROR_VOLUMES	controller1:vol1,vol2,vol3
NTAP_SNAPMIRROR_USE_SNAPSHOT	Y
NTAP_SNAPMIRROR_MAX_TRANSFER	kbps or blank

Configuration option	Setting
NTAP_SNAPMIRROR_UPDATE	Y
NTAP_CLONE_SECONDARY_VOLUMES	controller1:controller1-sec/vol1,vol2,vol3
NTAP_CLONE_SECONDARY	Y
NTAP_CLONE_FOR_BACKUP	Y
NTAP_VOL_CLONE_RESERVE	none
NTAP_NUM_VOL_CLONES	1
NTAP_NFS_EXPORT_HOST	hostname
NTAP_NFS_EXPORT_ACCESS	root
NTAP_NFS_EXPORT_PERSISTENT	true
MOUNT_CMD01	Mount script or SnapDrive command to mount clone
MOUNT_CMD02	CLI command or script to start cloned database
UMOUNT_CMD01	Mount script or SnapDrive command to umount clone

For volume clone, run Snap Creator with the following options:

```
./snapcreator --profile profile_name --action clone_vol --policy
policy_nameoptional_arguments
```

Snapshot copy and Protection Manager update

When using Snap Creator to create a Snapshot copy, register the Snapshot copy with Protection Manager and then use Protection Manager to manage SnapVault or SnapMirror.

Configuration option	Setting
NTAP_PM_UPDATE	Y
NTAP_DFM_DATA_SET	controller1:dataset1/vol1,vol2;controller1:dataset2/vol3
NTAP_SNAPSHOT_NODELETE	Y
NTAP_PM_RUN_BACKUP	Y
NTAP_DFM_SNAPSHOT_FORMAT	mysnap_%T

Run Snap Creator with the following options:

```
./snapcreator --profile profile_name --action snap --policy policy_name
optional_arguments
```

> **Note:** Both Operations Manager and Protection Manager are required. Additionally, you must configure a dataset created by Snap Creator within Protection Manager and create a schedule for that dataset (secondary). Snap Creator or Protection Manager can delete primary Snapshot copies. Protection Manager manages all secondary Snapshot copies and their retentions.

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