



**Snap Creator® Framework 4.3.0**

# **Installation Guide**

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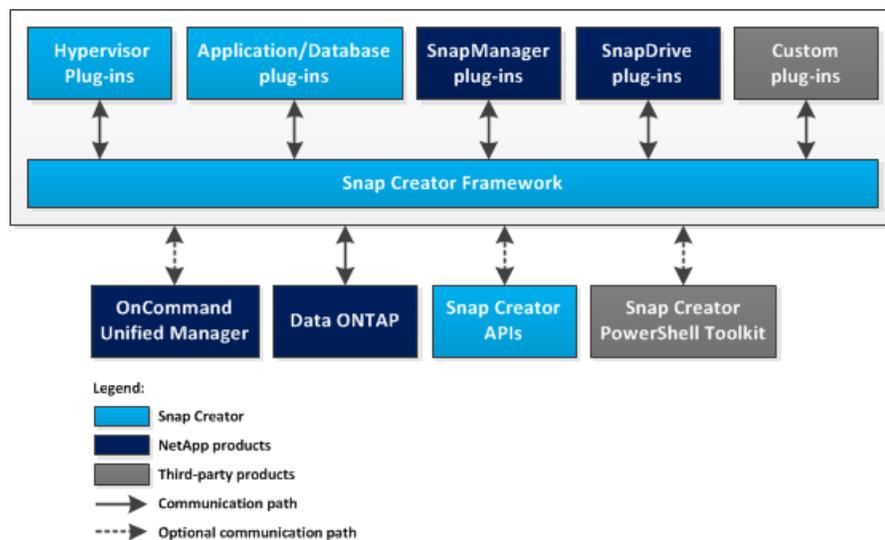
## What the Snap Creator Framework does

The Snap Creator Framework enables you to use prepackaged and custom plug-ins that standardize and simplify data protection for a wide variety of third-party applications, databases, and hypervisors in Windows and UNIX (AIX, HP-UX, Linux, and Solaris) environments.

By leveraging Snapshot, SnapVault, Open Systems SnapVault, and SnapMirror functionalities, as well as NetApp Management Console data protection capabilities, the Operations Manager console, and FlexClone, Snap Creator provides the following:

- Application-consistent data protection  
A centralized solution for backing up critical information, integrating with existing application architectures to ensure data consistency and reduce operating costs.
- Extensibility  
Achieve fast integration using modular architecture and policy-based automation.
- Cloud readiness  
Operating system-independent Snap Creator functionality supports physical and virtual platforms and interoperates with IT-as-a-service and cloud environments.
- Cloning capability  
Space-efficient data cloning is supported for development and test purposes.

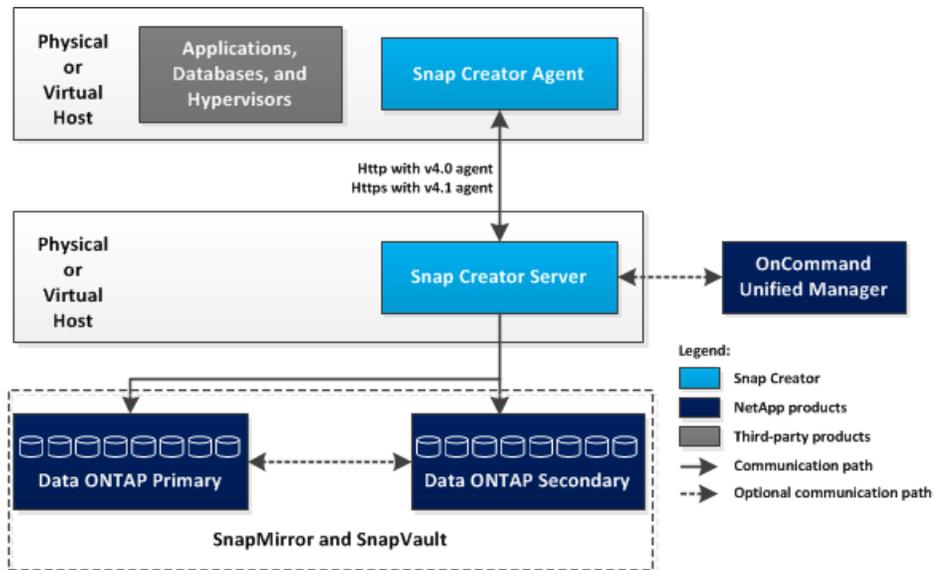
The following illustration shows Snap Creator Framework components:



## Snap Creator architecture

Snap Creator has a full-featured server and agent architecture, which consists of three main components: Snap Creator Server, Snap Creator Agent, and plug-ins.

Snap Creator interacts and integrates with various technologies and products as depicted in the following high-level diagram:



The NetApp software products in the high-level diagram are optional; except for Snapshot technology, the other software products are not required for the Snap Creator Framework to function.

## Snap Creator Server

Snap Creator actions are initiated by the Snap Creator Server.

Typically, the Snap Creator Server is installed on a physical or virtual host. The Server hosts the Snap Creator GUI and necessary databases for storing information about jobs, schedules, users, roles, profiles, configuration files, and metadata from plug-ins. The Server is sometimes shortened to scServer within Snap Creator.

The Server sends quiesce or unquiesce operations to the supported applications (database, email, hypervisor, or any other custom application) through the Snap Creator Agent. Communication between the Server and the Snap Creator Agent occurs by default on port 9090, but you can be customize the port to fit your needs.

By default, the Snap Creator Server uses Data ONTAP API calls to communicate with the storage systems and other NetApp software products. Commands to the storage system from the Snap Creator Server occur over port 80 or port 443 and handle all Snapshot, SnapVault, and SnapMirror-type functions before committing changes to storage devices or pools.

The Snap Creator Server communicates with OnCommand Unified Manager through the Unified Manager API.

### Related information

[Snap Creator Framework 4.1.1 Administration Guide](#)

## Snap Creator Agent

The Snap Creator Agent is typically installed on the same host where an application or database is installed. The Agent is where the plug-ins are located. The Agent is sometimes shortened to scAgent within Snap Creator.

The Agent accepts application quiesce and unquiesce commands, as well as other PRE/POST commands, from the Snap Creator Server. The Snap Creator Agent is required when using plug-ins.

### Related information

[Snap Creator Framework 4.1.1 Administration Guide](#)

## Plug-ins for application integration

Plug-ins are used to put applications or databases into a consistent state. Snap Creator contains several plug-ins that are already part of the binary file and do not require any additional installation.

Types of applications that are supported include database, email, hypervisor, or custom applications. The following plug-ins are supported for use with Snap Creator:

- Application and database plug-ins:
  - DB2
  - IBM Domino (Domino)
  - MaxDB
  - MySQL
    - Note:** The MySQL plug-in does not support backup and restore operations for multiple databases.
  - Oracle
  - SAP High-Performance Analytic Appliance (HANA)
  - Sybase Adaptive Server Enterprise (ASE)
- SnapManager plug-ins:
  - SnapManager for Microsoft Exchange
  - SnapManager for Microsoft SQL Server
- Hypervisor plug-ins:
  - Citrix XenServer
  - Red Hat Kernel-based Virtual Machine (KVM)
  - VMware (vSphere for individual virtual machine backup and vCloud Director for vApp backup)

Custom (also called "community") plug-ins are written by the developer community, and can be enabled by Snap Creator but are not supported. These plug-ins leverage the interface provided by Snap Creator and enable the developers to concentrate their development efforts on their target applications.

For more information, visit the [Snap Creator Framework Discussions Community forum](#) site.

### Related information

[Snap Creator Framework 4.1.1 Administration Guide](#)

## Preinstallation requirements for Snap Creator

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There are system license, software, and hardware requirements that you should consider before you install Snap Creator.

In addition, you should perform the following tasks before installing Snap Creator:

- Download the Snap Creator software.
- Create a Data ONTAP user.
- Install Java on the Snap Creator Server and Agent hosts.
- Synchronize time on Snap Creator Server and Agent hosts.
- Configure settings for the IBM Domino plug-in (required only if you are using the Domino plug-in).
- Add Secure Sockets Layer (SSL) libraries for the UNIX environment (required only when running Snap Creator using the CLI on UNIX platforms).

For details, see the *Troubleshooting* section in the *Snap Creator Framework Administration Guide*.

## Snap Creator installation and configuration requirements

Before you install the Snap Creator Framework, you should be aware of certain installation and configuration requirements for licenses, software, and hardware.

### License requirements

Although Snap Creator does not require a license, the following licenses might be required, depending on the actions you want to perform while using Snap Creator:

- FlexClone (for volume cloning)
- OnCommand Unified Manager Core Package (for NetApp Management Console data protection capability and Operations Manager console)
- Open Systems SnapVault (for OSSV actions)
- SnapDrive (for SnapDrive actions)
- SnapMirror (for SnapMirror actions)
- SnapRestore (for restoring)
- SnapVault (for SnapVault actions)

See the Interoperability Matrix, which is online at [mysupport.netapp.com/matrix](https://mysupport.netapp.com/matrix), for details regarding the supported software.

### Software information

The following software might be needed depending on your environment:

- Java (required)
- Data ONTAP (required)
- Microsoft .NET Framework

- Operating system:
  - Note:** Only U.S.-based operating systems are currently supported.
  - UNIX platforms:
    - Note:** Snap Creator supports only Bash Shell for all UNIX platforms.
    - AIX
    - HP-UX
    - Linux
    - Solaris
  - Microsoft Windows
- Web browsers:
  - Internet Explorer
  - Firefox

See the Interoperability Matrix, which is online at [mysupport.netapp.com/matrix](https://mysupport.netapp.com/matrix), for details regarding the supported software.

### Hardware requirements

The Snap Creator hardware requirements are as follows:

- Snap Creator Server requirements:

| Hardware component                                  | Minimum  | Recommended   |
|---|----------|---|
| Processor   | 1 core   | 4 cores, 2 GHz or faster                                    |
| Memory (for Snap Creator plus the operating system) | 2 GB RAM | 4 GB RAM  |
| Disk space  | 5 GB     | 50 GB or greater (based on the number of logs to be stored) |

- Snap Creator Agent requirements:  
Requires a minimum of 256 MB memory when either no plug-in is deployed or when prepackaged plug-ins are used.  
Prepackaged plug-ins should not need any additional memory requirements. Other plug-ins might have additional requirements.

## Downloading the Snap Creator software

You download the Snap Creator software from the NetApp Support Site. Snap Creator is listed in the “Software Download” section under Snap Creator Framework.

### Steps

1. Go to the **Software** page at the NetApp Support Site.  
Snap Creator is listed in the **Downloads > Software** section as **Snap Creator Framework**.

2. Select a platform, and then click **Go**.
3. Select the version of Snap Creator to download by clicking **View & Download**.
4. From **Software download instructions**, click **CONTINUE**.
5. Read and accept the End User License Agreement.
6. Select the operating system and bit level of the software package.

#### Related information

*NetApp Support Site: [mysupport.netapp.com](https://mysupport.netapp.com)*

## Creating a Snap Creator user for Data ONTAP

Prior to installing Snap Creator, you should create a Snap Creator user for Data ONTAP. The process that you follow to create the Snap Creator user depends on whether your systems are running Data ONTAP in 7-Mode or clustered Data ONTAP.

### Creating a Snap Creator user for Data ONTAP operating in 7-Mode

Snap Creator uses the Data ONTAP APIs to communicate with the storage system. To ensure that the user account is granted access to only Snap Creator, create a new role, group, and user on each storage controller. The role is assigned to the group and the group contains the user. This controls the access and limits the scope of the Snap Creator account.

#### About this task

You must perform this procedure once for each storage controller on which Snap Creator is installed.

To create a Snap Creator user for Data ONTAP operating in 7-Mode by using the Data ONTAP CLI (SSH, console connection, or Telnet), complete the following steps.

**Note:** You should not copy and paste commands directly from this document; errors might result such as incorrectly transferred characters caused by line breaks and hard returns. Copy and paste the commands from this procedure into a text editor, verify the commands, and then enter them in the CLI.

#### Steps

1. Create a role defining the rights required for Snap Creator on the storage system by running 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-*api-clone-*, api-options-get, api-wafl-sync
```

**Note:** The command shown in this step includes all the API roles used by Snap Creator. However, you can restrict the user access by including only the required roles (for example, if SnapMirror will not be used, then `api-snapmirror-*` is not needed).

#### Example

```
useradmin role add sc_role -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-*, api-clone-*, api-options-get, api-wafl-sync
```

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

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

#### Example

```
useradmin group add snap_creator_group -r snap_creator_role
```

3. Create a user account by running the following command:

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

#### Example

```
useradmin user add snap_creator_user -g snap_creator_group
```

4. Enter the password for the account.

#### Result

Use this restricted account when creating configuration files for Snap Creator.

## Creating a Snap Creator user for clustered Data ONTAP

For clustered Data ONTAP, you should create users for Snap Creator. However, the type of user that you create depends on the version of clustered Data ONTAP. The two types of users are a cluster user and a Storage Virtual Machine (SVM) user.

#### About this task

Create the following users, with the appropriate roles as defined in the *Snap Creator Framework Administration Guide*, for your version of Data ONTAP:

- Data ONTAP releases prior to clustered Data ONTAP 8.2: Create a cluster and SVM user.
- Clustered Data ONTAP 8.2 or later: Create an SVM user.

For increased security, you should create a Data ONTAP user and role specifically for Snap Creator. Alternatively, you can use other user accounts, such as admin or vsadmin.

For more information about creating a Snap Creator role using the CLI, see [Related references](#).

Both types of user require access to the Data ONTAPI library. In addition, a Management LIF is also needed for clustered Data ONTAP, regardless of the version.

The two users are not interchangeable. For example, the cluster user does not have access to the required APIs to perform certain actions, such as creating a Snapshot copy. This is true even if you use the default cluster admin account. SVM accounts should use the **vsadmin** role or a customer-created role for Snap Creator to work properly.

You must perform this procedure once on each SVM and cluster where Snap Creator is used.

For ease of use, the following instructions refer to admin and vsadmin roles; however, you can replace these role names with those roles that you create.

**Note:** You should not copy and paste commands directly from this document; errors (such as incorrectly transferred characters caused by line breaks and hard returns) might result. Copy and paste the commands from this procedure into a text editor, verify the commands, and then enter them in the CLI.

### Steps

1. Create the SVM user `svm_username01` with the appropriate role (`vsadmin` or the role created for the user) on the `svm_name` SVM and enable access to the ONTAPI library by entering the following command and a user password:

```
security login create -username svm_username01
-vserver svm_name -application ontapi
-authmethod password -role vsadmin

Please enter a password for user 'svm_username01':
Please enter it again:
```

2. (For versions prior to clustered Data ONTAP 8.2 only) Create a cluster user by entering the following command and a user password:

```
security login create -username svm_username02
-vserver svm_clustername -application ontapi
-authmethod password -role admin

Please enter a password for user 'svm_username02':
Please enter it again:
```

### Related references

[CLI commands for creating a role for a Snap Creator user in clustered Data ONTAP](#) on page 54

## Installing Java on Snap Creator hosts

Java Runtime Environment (JRE) 1.6 Update 24 or later must be installed on any Snap Creator Server and Agent host.

### Steps

1. Download and install JRE on each Snap Creator Server or Snap Creator Agent host.
  - Note:** The bit levels (32-bit or 64-bit) of Java and Snap Creator must be the same.

If necessary, download Java from the [Java Downloads for All Operating Systems](#) page.
2. After you install JRE, verify the version and bit level 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 displays the installed version of Java. If the bit level is not displayed (as in the preceding example), then the installation is 32-bit.

## Synchronizing time on Snap Creator Server and Agent hosts

Before installing Snap Creator, you should ensure that the time on the Snap Creator Server host is in sync with the time on the Agent host. You can do this by synchronizing the time of the hosts with the same Network Time Protocol (NTP) server.

For more information, refer to the following documentation:

- Clustered Data ONTAP—*Clustered Data ONTAP Software Setup Guide* for your version of Data ONTAP; in particular, refer to the information regarding verifying the system time and synchronizing the system time across the cluster.
- Data ONTAP operating in 7-Mode—Knowledgebase article 1011954 How to setup NTP time synchronization at [kb.netapp.com/support/index?page=content&id=1011954&locale=en\\_US](http://kb.netapp.com/support/index?page=content&id=1011954&locale=en_US).

## Configuring settings for the Domino plug-in

You need to configure specific settings only if you plan to use the IBM Domino plug-in, which is included as part of the Snap Creator Agent installation.

**Note:** It is a best practice to install Snap Creator Server and Snap Creator Agent on different hosts.

Depending on your operating system, you must configure these settings before installing the Snap Creator Agent for the IBM Domino plug-in to work properly.

- For a Windows environment, you must add the Domino path to the environment variables.
- For a UNIX environment, you must create symbolic links to link to Domino's shared object files.

### Configuring Windows-specific settings: Adding path to the environment variables

If you are going to install the Snap Creator Agent on Windows, you must add the path to the Domino binary files to the environment variables for Windows.

#### Step

1. Access the advanced settings for your Windows OS (for example, **My Computer > Properties > Advanced > Environment Variables**) and add the Domino path to the *Path* variable.

**Note:** For details about modifying your system variables, see the documentation for your Windows operating system.

#### After you finish

If you add the Domino path to the environment variables after the Snap Creator Agent is installed, you must restart the Snap Creator Agent service. For example, on the host where the Snap Creator Agent is installed, open a command prompt and enter the following commands:

```
sc stop SnapCreatorAgentService
sc start SnapCreatorAgentService
```

## Configuring UNIX-specific settings: Creating symbolic links

If you are going to install the Snap Creator Agent on a UNIX operating system (AIX, Linux, and Solaris), for the IBM Domino plug-in to work properly, three symbolic links (symlinks) must be created to link to Domino's shared object files.

Installation procedures vary slightly depending on the operating system. Refer to the appropriate procedure for your operating system.

**Note:** Domino does not support the HP-UX operating system.

### Creating symbolic links for the Domino plug-in on Linux and Solaris hosts

You need to perform this procedure if you want to create symbolic links for the Domino plug-in on Linux and Solaris hosts.

#### About this task

You should not copy and paste commands directly from this document; errors (such as incorrectly transferred characters caused by line breaks and hard returns) might result. Copy and paste the commands into a text editor, verify the commands, and then enter them in the CLI console.

**Note:** The paths provided in the following steps refer to the 32-bit systems; 64-bit systems must create simlinks to `/usr/lib64` instead of `/usr/lib`.

#### Steps

1. Add links to `/usr/lib` for the following files:

- `libxmlproc.so`
- `libndgts.so`
- `libnotes.so`
- `libgsk8iccs.so` (for Domino 9.0 or later only)

A typical method of creating a symbolic link is to use the `ln` command:

```
ln -s /path/to/source_file /usr/lib/linked_file
```

where:

- `-s` instructs the operating system to make a symbolic link.
- `/path/to/source_file` is the path to one of the Domino library files, including the file name.
- `linked_file` is the name of the file that is being linked.

#### Example

```
ln -s /opt/ibm/domino/notes/latest/linux/libxmlproc.so /usr/lib/
libxmlproc.so
ln -s /opt/ibm/domino/notes/latest/linux/libndgts.so /usr/lib/
libndgts.so
ln -s /opt/ibm/domino/notes/latest/linux/libnotes.so /usr/lib/
libnotes.so
ln -s /opt/ibm/domino/notes/latest/linux/libgsk8iccs.so /usr/lib/
libgsk8iccs.so
```

2. Verify the path to the files listed in Step 1.

## Creating symbolic links for the Domino plug-in on AIX hosts

You must perform this procedure to add symbolic links for the Domino plug-in on AIX hosts.

### About this task

You should not copy and paste commands directly from this document; errors (such as incorrectly transferred characters caused by line breaks and hard returns) might result. Copy and paste the commands into a text editor, verify the commands, and then enter them in the CLI console.

**Note:** The paths provided in the following steps refer to the 32-bit systems; 64-bit systems must create simlinks to `/usr/lib64` instead of `/usr/lib`.

### Steps

1. Add links to `/usr/lib` for the following files:

- `libxmlproc_r.a`
- `libndgts_r.a`
- `libnotes_r.a`
- `libgsk8iccs_r.a` (for Domino 9.0 or later only)

A typical method of creating a symbolic link is to use the `ln` command:

```
ln -s /path/to/source_file /usr/lib/linked_file
```

where:

- `-s` instructs the operating system to make a symbolic link.
- `/path/to/source_file` is the path to one of the Domino library files, including the file name.
- `linked_file` is the name of the file that is being linked.

### Example

```
ln -s /opt/ibm/domino/notes/latest/ibmpow/libxmlproc_r.a /usr/lib/
libxmlproc_r.a
ln -s /opt/ibm/domino/notes/latest/ibmpow/libndgts_r.a /usr/lib/
libndgts_r.a
ln -s /opt/ibm/domino/notes/latest/ibmpow/libnotes_r.a /usr/lib/
libnotes_r.a
ln -s /opt/ibm/domino/notes/latest/linux/libgsk8iccs.so /usr/lib/
libgsk8iccs_r.a
```

2. Verify the path to the files listed in Step 1.

The commands in this example use the default path for AIX, but installations can vary.

## Installing the Snap Creator Server

---

You can install the Snap Creator Server on Windows and UNIX hosts.

In a typical installation, the Snap Creator Server and the Snap Creator Agent are installed on separate hosts. However, in some instances, the Server and Agent can be installed at the same time. In this setup, only the Server is configured during the installation.

### Installing the Snap Creator Server on a Windows host

You can install the Snap Creator Server on a Windows host by using the Windows installer.

#### Before you begin

- JRE 1.6 Update 24 or later must be installed.  
For details, see information in the related links about installing Java on Snap Creator servers.
- The person performing the installation must have admin-level privileges to perform the installation.
- The default port for the Snap Creator Server is 8443.  
You can use netstat or a similar tool to verify that the network port that you want to use (as long as the port supports HTTPS) is available and is not already in use (for example, Windows: `netstat -na | find "8443"`).
- Snap Creator should already be downloaded.  
For details, see information in the related tasks about downloading the Snap Creator software.

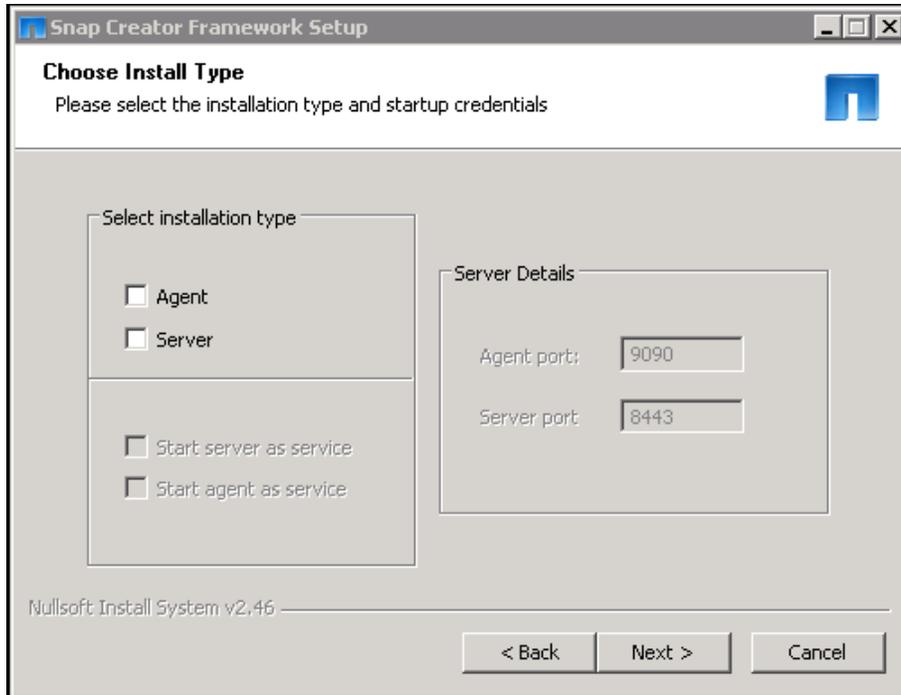
#### Steps

1. Double-click `Snap_Creator_Frameworkrelease-Windowsversion.exe` file

#### Example

To launch the Snap Creator installer, you would use `Snap_Creator_Framework4.1.0-Windows64.exe`.

2. On the Welcome page, click **Next** to start the installation.
3. Read and accept the terms of the license agreement.
4. On the **Choose Install Type** page, change the settings to fit various installation types, and then click **Next**.



### Select installation type

Select **Server**. Both the Snap Creator Server and Agent can be installed at the same time if you want them both on the same system.

### Start server as service

Select this option to automatically install and start `snapcreatorserverservice` immediately after the installation process is complete. If it is not selected, the **Server port** field is disabled.

**Note:** If you do not select this option, the service is not installed and you need to manually start the Snap Creator Server by running a batch script from a command prompt.

For information about starting the server from a command prompt, see [Related tasks](#).

### Server port

Accept the default port of 8443 or specify the port number.

5. Configure the **Profile Setup** page, and then click **Next**.

The information entered on the Profile Setup page is used to set up the profile required for the Snap Creator GUI.

### Controller serial number

This parameter is optional. Enter the serial number of one of your storage controllers. When this information is provided, the controller serial number is embedded into the Snap Creator properties file and included in support and log outputs. This information can be used to help troubleshoot any issues that happen in the future.

### User name

Enter the name of the Snap Creator Server administrator.

### Password and confirmation

Enter the password for the Snap Creator Server administrator.

### Enable job monitor

If you want to enable job monitoring, select the **Enable job monitor** check box. Job Monitor is a separate section in the GUI that monitors all of the jobs that are run by Snap Creator and the status of these jobs.

#### Job log size

Enter the number of jobs to keep in the history of the job log. The default is 100; the size should be between 1 and 1000.

**Note:** Although the maximum accepted value for the **Job log size** is 10,000, the recommended maximum size that you provide is 1000.

6. On the **Choose Install Location** page, enter the Snap Creator installation path or accept the default (C:\Program Files\NetApp\Snap\_Creator\_Framework), and then click **Next**.
7. On the **Choose Start Menu Folder** page, customize the folder in which Snap Creator should appear in the Windows Start Menu or accept the default, and then click **Install**.
8. After the installation is complete, click **Next**.

During the Snap Creator Server service installation, a command prompt is displayed if a service was selected as part of the installation options. This process attempts to start existing services; therefore, it is common to see failure messages listed as part of this step.

9. Click **Finish** to close the Windows installer.

#### After you finish

Validate the Snap Creator Framework GUI startup by navigating to the local host on the specified port (`https://IP_address:gui_port`).

You must connect using HTTPS; otherwise, the connection is not automatically redirected to an HTTPS connection and the GUI will not work.

#### Related tasks

- [Installing Java on Snap Creator hosts](#) on page 12
- [Downloading the Snap Creator software](#) on page 9
- [Starting the Server from a command prompt](#) on page 18

## Starting the Server from a command prompt

You can manually start the Snap Creator Server from a command prompt by running a batch script (`scServer.bat`).

#### About this task

Typically, you must follow this procedure only if you did not select the **Start server as service** option during installation.

You can also schedule the batch script (`scServer.bat`) to run at startup through the Windows task scheduler. For details about using the Windows task scheduler, see the documentation for your Windows operating system.

Because the batch script (`scServer.bat`) runs Snap Creator in the foreground, the Snap Creator Server continues to run only as long as the command prompt is open. Closing the command prompt quits the Snap Creator Server. To run in the background, the Snap Creator Server service should be used.

**Step**

1. Open a command prompt and enter the following commands:

```
cd \install_path\scServerrelease-version\bin\  
scServer.bat start
```

**Example**

```
cd \Program Files\NetApp\Snap_Creator_Framework\scServer4.1.0\bin\  
scServer.bat start
```

## Installing the Snap Creator Server on UNIX-based systems

For UNIX platforms (AIX, HP-UX, Linux, and Solaris), the process of installing Snap Creator consists of extracting the Snap Creator software package (a `.tar` file containing both the Snap Creator Server and the Snap Creator Agent), running a setup script, starting the service, and validating the port.

**Before you begin**

JRE 1.6 Update 24 or later must be installed. For details, see information in the related links about installing Java on Snap Creator servers.

The person performing the installation must have sufficient access and privileges to perform the installation.

**Note:** You must have root-level privileges to perform the initial setup.

The default port for the Snap Creator Server is 8443. Use `netstat` or a similar tool to verify that the network port that you want to use supports HTTPS, is available, and is not already in use (for example, on UNIX hosts enter: `netstat -nap | grep 8443`).

Snap Creator should already be downloaded. For details, see information about downloading the Snap Creator software.

**About this task**

The UNIX Services (Server and Agent) feature provides a start script for the Snap Creator Server and the Snap Creator Agent. The `start` scripts are written in a UNIX shell script (Bourne shell) and are designed to run on all the UNIX environments that are supported by Snap Creator.

**Steps**

1. Copy the downloaded Snap Creator `tar.gz` file to the location where you want to install the Snap Creator Server:
  - a. Create a subdirectory:

```
mkdir snap_creator_directory
```

**Example**

```
mkdir /SC_41
```

- b. Copy the Snap Creator `tar.gz` file to the newly created directory:

```
cp NetApp_Snap_Creator_Frameworkrelease-os.tar.gz
/snap_creator_directory
```

### Example

```
cp NetApp_Snap_Creator_Framework4.1.0-Linux32.tar.gz
/SC_41
```

2. Change to the directory to where the Snap Creator Framework `.tar` file is located and extract the file:

**Note:** Depending on the UNIX environment, you might be required to unzip the file before entering the `tar` command.

```
cd snap_creator_directory
tar -xvf NetApp_Snap_Creator_Frameworkrelease-os.tar.gz
```

- `snap_creator_directory` is the location where Snap Creator will be installed.
- `release` is the current release of the Snap Creator software package.
- `os` is the operating system.

### Example

```
cd /sc_41
tar -xvf NetApp_Snap_Creator_Framework4.1.0-Linux32.tar.gz
```

This extracts both the Server and the Agent software. Typically, only the Snap Creator Server is configured. The agents normally reside on the database or application servers to be protected as seen in the following example:

```
NetApp_Snap_Creator_Framework4.1.0-Linux32.tar.gz  scServer4.1.0
scAgent4.1.0
```

3. Enter the following commands and respond to the prompts to perform the initial setup of Snap Creator:

```
cd scServer*
./snapcreator --setup
Welcome to the NetApp Snap Creator Framework release-version!
### Installation options ###
01. NetApp Snap Creator Framework release-version Server
02. NetApp Snap Creator Framework release-version Remote CLI
Select install option (enter a number or "q" to quit):
```

Enter 01 to install the Snap Creator Server.

- Option 01 performs the initial setup of the Snap Creator Server by configuring a Snap Creator user and password, designating the GUI port where the Snap Creator Server will run and configuring other parameters.
- Option 02 sets up the Snap Creator Server as a local binary and enables you to issue commands from your local system CLI to a remote Snap Creator Server.

4. To accept the end user license agreement, enter "y" here:

```
END USER LICENSE AGREEMENT
...the EULA displays...

Do you accept the End User License Agreement (y|n): <Enter y>

Enter controller serial number (Recommended): <OPTIONAL: Enter serial
number for one of your storage controllers>
```

5. Enter the controller serial number.

The controller serial number is embedded in the Snap Creator properties file and included in support and log outputs. This information can be used to help troubleshoot any issues that might happen later.

6. Enter the server port and continue with the prompts.

```
Enter Snap Creator server port [8443]: <Enter server port>

Enable job monitor (Y|N): <Enter Y>

Enter job monitor size, how many jobs to allow [100]: <Enter the
number of jobs from 1-1000>
```

**Note:** Although the maximum accepted value for the **job monitor size** is 10,000, the recommended maximum size that you provide is 1000.

```
Enter scServer Administrator Username: <Enter the Administrator
username>
Enter password for snap_creator_administrator: <Enter the password>
Confirm password for snap_creator_administrator: <Enter the password
again>

INFO: Updated NetApp Snap Creator Framework release-version
/install_path/scServerrelease-version/engine/etc/
snapcreator.properties
INFO: Updated NetApp Snap Creator Framework release-version
/install_path/scServerrelease-version/bin/scServer

INFO: To start scServer please do the following:

/install_path/scServerrelease-version/bin/scServer start

INFO: To access NetApp Snap Creator Framework release-version GUI
goto https://hostname:gui_port
```

7. Start the Snap Creator Framework Server:

```
/install_path/scServerrelease-version/bin/scServer start
Checking Status of scServer:
Running
```

8. Validate the Snap Creator Framework GUI startup by navigating to the local host on the specified port (for example, `https://10.12.123.123:8443`).

You must connect using HTTPS; otherwise, the GUI does not work.

If communication goes through a firewall, open the network port.

#### Related tasks

[Installing Java on Snap Creator hosts](#) on page 12

*Downloading the Snap Creator software* on page 9

## Installing the Snap Creator Agent

---

You can install the Snap Creator Agent on Windows and UNIX hosts.

**Important:** Although installing and running multiple agents on a single host is allowed, the best practice is to use a single agent per host.

If you plan to use the IBM Domino plug-in, the plug-in requires Snap Creator Agent to be installed in a location other than the Domino data folder.

### Installing the Snap Creator Agent on Windows

You can install the Snap Creator Agent on Windows hosts by using the Windows installer.

#### Before you begin

- JRE 1.6 Update 24 or later must be installed.
- The person performing the installation must have administrator-level privileges.
- The default port (9090) or other network port must be available.
- Snap Creator must be already downloaded.

#### Steps

1. Double-click the `Snap_Creator_Frameworkrelease-Windowsversion.exe` file icon (for example, `Snap_Creator_Framework4.1.0-Windows64.exe`) to launch the Snap Creator installer.
2. On the **Welcome** page, click **Next** to start the installation.
3. Review and accept the terms of the license agreement:
4. On the **Choose Install Type** page, change the following settings to fit various installation types:

#### Select installation type

Select **Agent**.

#### Start agent as service

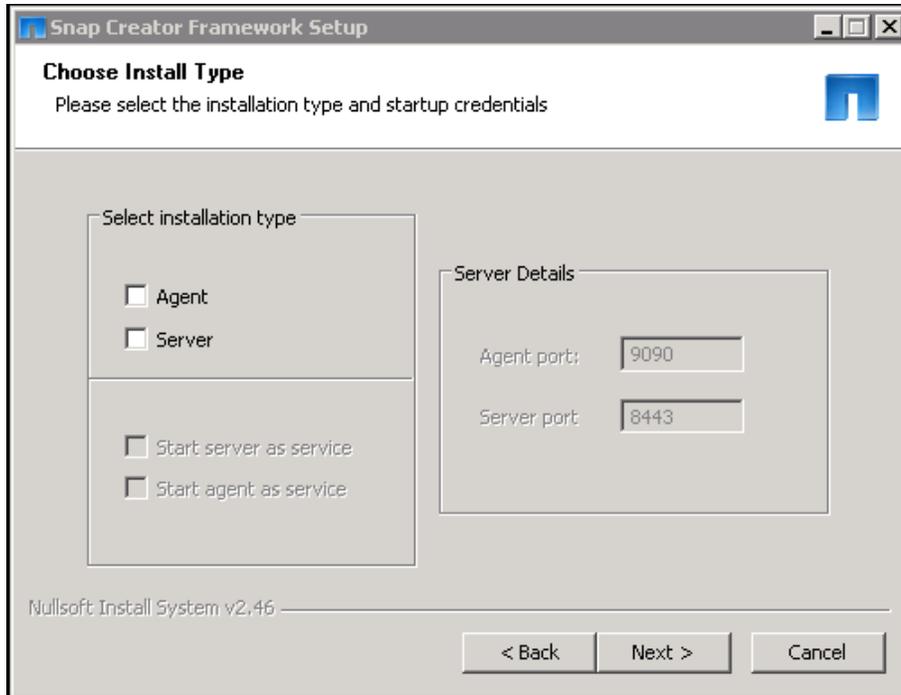
Select this option to install and start the **snapcreatoragentservice** immediately after the installation process is complete.

If it is not selected, the **Agent port** field is disabled.

**Note:** If you do not select this option, the service is not installed and you must manually start the Agent by running a batch script from a command prompt.

#### Agent port

Accept the default port of 9090 or specify the port number.



5. Click **Next**.
6. On the **Choose Install Location** page, enter a Snap Creator installation path or accept the default (C:\Program Files\NetApp\Snap\_Creator\_Framework), and then click **Next**.
 

**Note:** If you plan to use the IBM Domino plug-in, select a location other than the Domino data folder.
7. On the **Choose Start Menu Folder** page, customize the folder in which Snap Creator should appear in the Windows Start Menu or accept the default, and then click **Install**.
8. After the installation finishes, click **Next**.
 

During the Snap Creator Agent service installation, a command prompt is displayed if a service was selected as part of the installation options. This process attempts to start existing services; therefore, it is common to see failure messages listed as part of this step, which you should ignore.
9. Click **Finish** to close the Windows installer.

#### After you finish

If you did not select the **Start agent as service** option during the installation process, you must manually start the Snap Creator Agent.

#### Related tasks

- [Installing Java on Snap Creator hosts](#) on page 12
- [Downloading the Snap Creator software](#) on page 9
- [Starting the Agent from a command prompt](#) on page 25

## Starting the Agent from a command prompt

You can manually start the Snap Creator Agent from a command prompt by running a batch script (`scAgent.bat`).

### About this task

Typically, you should follow this procedure only if you did not select the **Start agent as service** option during the installation process.

You can also schedule the batch script (`scAgent.bat`) to run at startup through the Windows task scheduler. For details about using the Windows task scheduler, see the documentation for your Windows operating system.

### Step

1. Open a command prompt and enter the following commands:

```
cd \install_path\scAgentrelease-version\bin\  
scAgent.bat start
```

### Example

```
cd \Program Files\NetApp\Snap_Creator_Framework\scAgent4.1.0\bin\  
scAgent.bat start
```

### After you finish

Because the batch script (`scAgent.bat`) runs Snap Creator in the foreground, the Snap Creator Agent continues to run only as long as the command prompt is open. Closing the command prompt will quit the Snap Creator Agent. To run Snap Creator in the background, the Snap Creator Agent service should be used.

## Installing the Snap Creator Agent on UNIX-based systems

The Snap Creator Agent runs on any open systems platform (AIX, HP-UX, Linux, and Solaris).

### Before you begin

JRE 1.6 Update 24 or later must be installed. For details, see information in related links about installing Java on Snap Creator servers.

The person performing the installation must have sufficient access and privileges.

The default port for the Snap Creator Agent is 9090. Use `netstat` or a similar tool to verify that the network port (9090 or the port that you want to use) is available and is not already in use (for example, enter: `netstat -nap | grep 9090`).

Snap Creator should already be downloaded. For details, see information about downloading the Snap Creator software.

### About this task

Linux is used here as the example platform.

**Steps**

1. Copy the downloaded Snap Creator `tar.gz` file to the location where you want to install Snap Creator Agent.

**Note:** If you plan to use the IBM Domino plug-in, select a location other than the Domino data folder.

- a. To make a subdirectory, enter the following command with the directory name:

```
mkdir snap_creator_directory
```

**Example**

```
mkdir /SC_41
```

- b. Copy the Snap Creator `tar.gz` file to the newly created directory by entering the following command:

```
cp NetApp_Snap_Creator_Frameworkrelease-os.tar.gz
/snap_creator_directory
```

**Example**

```
cp NetApp_Snap_Creator_Framework4.1.0-Linux32.tar.gz
/SC_41
```

2. Change to the directory to where the Snap Creator Framework `.tar` file is located and extract the file by entering the following commands:

**Note:** Depending on the UNIX environment, you might be required to unzip the file before entering the `tar` command.

```
cd snap_creator_directory
tar -xvf NetApp_Snap_Creator_Frameworkrelease-os.tar.gz
```

- `snap_creator_directory` is the location where Snap Creator will be installed.
- `release` is the current release of the Snap Creator software package.
- `os` is the operating system.

**Example**

```
cd /sc_41
tar -xvf NetApp_Snap_Creator_Framework4.1.0-Linux32.tar.gz
```

This extracts both the Server and the Agent software. Typically, only the Snap Creator Server is configured. The agents normally reside on the database or application servers to be protected as seen in the following example:

```
NetApp_Snap_Creator_Framework4.1.0-Linux32.tar.gz  scServer4.1.0
scAgent4.1.0
```

3. Enter the following commands and respond to the prompts shown in the example to set up the Snap Creator Agent.

```
cd scAgent*
./snapcreator --setup
Welcome to the NetApp Snap Creator Framework release-version!
### Installation options ###
01. NetApp Snap Creator Framework release-version Agent
Select install option (enter a number or "q" to quit): <Enter 01>

END USER LICENSE AGREEMENT
<...the EULA displays...>

Do you accept the End User License Agreement (y|n): <Enter y>

Enter Snap Creator server port [9090]: <Enter agent port>

INFO: Updated NetApp Snap Creator Framework release-version
/install_path/scAgentrelease-version/engine/etc/agent.properties

INFO: To start scAgent please do the following:

/install_path/scAgentrelease-version/bin/scAgent start
```

4. Start the Snap Creator Agent:

```
/install_path/scAgentrelease-version/bin/scAgent start
```

**Note:** To have the Snap Creator Agent run automatically at startup, add the `start` command to a script.

The steps to create a script differ slightly depending on the operating system used and the preferences of the system administrator managing the server. Generally, the `start` command for the Snap Creator Agent can be added to a file beginning with `S9` (for example, `S99scAgent`) that is placed in the `/path/to/rc2.d` subdirectory. The `rc2.d` subdirectory is commonly located under `/etc/`, but this can depend on the host operating system and the particular configuration of the server. For more information, refer to the documentation of the operating system in use.

The following message appears:

```
Starting scAgent:
  Watchdog: Running
  Agent: Running
```

#### Related tasks

[Installing Java on Snap Creator hosts](#) on page 12

[Downloading the Snap Creator software](#) on page 9

## Changing the Snap Creator Agent port after installation

To change the port where the Snap Creator Agent is listening, you can make a change in the Snap Creator `agent.properties` file and restart the Agent.

#### About this task

The procedure is the same for Windows and UNIX; the following procedure uses the UNIX environment in the examples.

To change the Snap Creator Agent port after installation, perform the following steps.

### Steps

1. Log in to the system where the Snap Creator Agent is running and change directories to the `etc` subdirectory within the installation directory.

### Example

```
cd /install_path/scAgent4.1.0/etc
```

2. Open the `agent.properties` file with a text editor.
3. Change the value of the `DEFAULT_PORT` parameter (by default, the port is 9090) to the new port.

### Example

For example, to use port 9191, change the `DEFAULT_PORT` parameter as follows:

```
DEFAULT_PORT=9191
```

Save and close the file after making changes.

4. Restart the Snap Creator Agent.

### Example

```
/install_path/scAgent4.1.0/bin/scAgent restart
```

**Note:** Any changes to the `allowed_commands.config` or `agent.properties` files require restarting the Snap Creator Agent if it is running when the changes are made.

## Upgrading Snap Creator

---

You can upgrade to the latest version of Snap Creator from various supported versions.

**Note:** If you have any questions about whether you can upgrade from releases posted on the Communities site, you can submit general questions to the NetApp Communities Forum. The NetApp Communities Forum is online at: [https://communities.netapp.com/community/products\\_and\\_solutions/databases\\_and\\_enterprise\\_apps/snapcreator](https://communities.netapp.com/community/products_and_solutions/databases_and_enterprise_apps/snapcreator)

Before upgrading to the latest version of Snap Creator, check the job monitor size for the currently installed version of Snap Creator. When you upgrade Snap Creator, you must set the job monitor size equal to or greater than the previous setting to avoid data loss in the job monitor database.

In addition, when upgrading Snap Creator, you must ensure the upgrade takes place on a host that uses the same operating system environment. For example, if you are upgrading in a Windows environment, you should make sure that when you copy backed-up data you also copy the data back to a Windows environment and not UNIX-based system.

**Important:** Snap Creator does not have a downgrade (revert) option. During an upgrade process, you back up several files. It is important to keep the backed-up files until you are certain that you do not need to revert to an earlier version of Snap Creator.

### Related tasks

[Checking job monitor size](#) on page 29

## Checking job monitor size

Before upgrading to the latest version of Snap Creator, you should check the job monitor size for the currently installed version of Snap Creator.

### About this task

When you upgrade Snap Creator, make sure that you set the job monitor size equal to or greater than the previous setting to avoid data loss in the job monitor database. Snap Creator retrieves jobs only up to the updated job monitor size limit.

For example, if the job monitor size is 500 in Snap Creator 4.0, make sure to set the job monitor size to a number equal to or greater than 500 when upgrading to the latest Snap Creator.

### Step

1. Check the job monitor size by performing one of the following options:
  - Open the Snap Creator Server properties files (`/install_path/scServer4.1.x/engine/etc/snapcreator.properties`) and check the `SNAPCREATOR_JOB_MONITOR_SIZE` variable.
  - From the Snap Creator GUI main menu, select **Management > Job Monitor** and then click **Size**.  
The Job Monitor Size dialog box is displayed with the current size in the top field.

## Upgrading from releases earlier than Snap Creator 3.6

If you are upgrading from releases earlier than Snap Creator 3.6, you must first upgrade to Snap Creator 3.6 one version at a time.

For example, to upgrade from Snap Creator 3.5.x, you must first upgrade from 3.5.x to 3.6. After you are running Snap Creator 3.6, you can complete the upgrade to latest version. During this upgrade process, you can install the Snap Creator Agent at the same time as you upgrade the Snap Creator Server.

### Related tasks

[Upgrading the Snap Creator Server 3.6.x on Windows](#) on page 30

## Upgrading from Snap Creator 3.6.x

When you upgrade from Snap Creator 3.6.x, the database schema is upgraded and all the configuration file passwords are updated for compatibility with the latest Snap Creator.

### Upgrading the Snap Creator Server 3.6.x on Windows

You can upgrade directly from the Snap Creator Server 3.6.x on Windows.

#### Before you begin

- If you have any Snap Create user names that contain special characters, you must have renamed those users using only alphabetic characters (a-z, A-Z) before performing the upgrade.
- You have stopped Snap Creator services (`snapcreatorserverservice` and `snapcreatoragentservice`) before backing up the Snap Creator directories to ensure that the backed up data is complete.

For example, you can use the Services snap-in to stop the services:

1. Select **Start > Run** and enter `services.msc`.
2. Locate and select the Snap Creator service; then, stop the service.

Alternatively, you can open a command prompt and enter the following commands:

```
sc stop snapcreatorserverservice
sc stop snapcreatoragentservice
```

- You have backed up the following directories and all associated subdirectories and files, within the Snap Creator 3.6.x Server directory (`C:\Program Files\NetApp\NetApp_Snap_Creator_Framework\scServer3.6.x`):
  - Snap Creator database (`..\gui\snapcreator`)
  - Profiles and configuration files (`..\configs`)
  - Logs (`..\logs`)

**Note:** Do not delete the Snap Creator 3.6.x backup copies that you created.
- (Optional) If the Snap Creator Agent is installed on the same host as the Snap Creator Server, you should backup the `agent.conf` file (`C:\Program Files\NetApp\NetApp_Snap_Creator_Framework\scServer3.6.x\config\agent.conf`)

**About this task**

The paths provided in the following steps refer to the default installation path for Windows. Your path information might differ if the defaults were not used.

After the upgrade process is complete, consider the following issues:

- If the Snap Creator database that is upgraded contains some tasks marked a “in progress”, the state remains the same even after the upgrade process is complete.
- The default administrator in latest Snap Creator must be an administrator in Snap Creator 3.6.x. If the 3.6.x user is not an administrator, then the upgrade assigns an operator role to the 3.6.x user.

**Steps**

1. Stop the Snap Creator services if you have not already done so.  
For information about stopping the services, see the details provided earlier in this topic.
2. Uninstall the Snap Creator (for Windows) by selecting **Start > Programs > Snap Creator > Uninstall NetApp Snap Creator Framework**.  
For details, see information about uninstalling Snap Creator on Windows.
3. Install the latest Snap Creator Server.  
For details, see the information about installing the Snap Creator Server on Windows.
4. If you selected to start the Snap Creator Server as a service when you installed the latest Snap Creator Server, then stop the service.  
For information on stopping the service, see the details provided earlier in this topic.
5. Delete the latest Snap Creator Server database folder (C:\Program Files\NetApp\Snap\_Creator\_Framework\scServer4.1.x\engine\snapcreator).
6. Copy the backed up Snap Creator 3.6.x database directory to the latest location (C:\Program Files\NetApp\Snap\_Creator\_Framework\scServer4.1.x\engine\snapcreator).
7. Copy the backed up Snap Creator 3.6.x profiles and configuration directory to the latest location (C:\Program Files\NetApp\Snap\_Creator\_Framework\scServer4.1.x\engine\configs).
8. Copy the backed up Snap Creator 3.6.x logs directory to the latest location (C:\Program Files\NetApp\Snap\_Creator\_Framework\scServer4.1.x\engine\logs).
9. Open a command prompt and change the directory to the engine subdirectory in the Snap Creator installation path (C:\Program Files\NetApp\Snap\_Creator\_Framework\scServer4.1.x\engine).
10. Upgrade Snap Creator by entering the following command:

```
java -jar snapcreator.jar -upgrade
```

**After you finish**

After the upgrade process is complete, start the Snap Creator Server service by doing one of the following:

- Use the Services snap-in and start the service.
- Enter the following command from a command prompt: `sc start snapcreatorserverservice`

Also, you must validate the Snap Creator Framework GUI startup by navigating to the local host on the specified port (`https://IP_address:gui_port`).

You must connect using HTTPS; otherwise, the connection is not automatically redirected to an HTTPS connection and the GUI will not work.

#### Related concepts

[Installing the Snap Creator Server](#) on page 16

#### Related tasks

[Uninstalling Snap Creator on Windows](#) on page 51

## Upgrading the Snap Creator Server 3.6.x on UNIX

You can upgrade directly from the Snap Creator Server 3.6.x on UNIX.

#### Before you begin

- If you have any user names that contain special characters in Snap Creator, you must have renamed those users using only alphabetic characters (a-z, A-Z) before performing the upgrade.
- You have stopped the Snap Creator processes before backing up the Snap Creator directories to ensure that the backed up data is complete.

For example, enter the following commands:

```
/install_path/scServer3.6.x/bin/scServer stop
/install_path/scAgent3.6.x/bin/scAgent stop
```

- You have backed up the up the following directories and all associated subdirectories and files, within the Snap Creator 3.6.x Server directory (`/install_path/scServer3.6.x`):
  - Snap Creator database (`./gui/snapcreator`)
  - Profiles and configuration files (`./configs`)
  - Logs (`./logs`)

**Note:** Do not delete the Snap Creator 3.6.x backup copies that you created.

#### About this task

The paths provided in the following steps refer to the default installation path. The path in the commands below might differ from your installation path.

After the upgrade process is complete, consider the following issues:

- If the Snap Creator database that is upgraded contains some tasks marked as “in progress”, the state remains the same even after the upgrade process is complete.
- The default administrator in the latest Snap Creator must be an administrator in Snap Creator 3.6.x. If the 3.6.x user is not an administrator, then the upgrade assigns an operator role to the 3.6.x user.

#### Steps

1. Stop the Snap Creator processes if you have not already done so.

For information about stopping the processes, see the details provided earlier in this topic.

2. Install the latest Snap Creator, but do not start the Snap Creator Server service.

For details, see information about installing the Snap Creator Server on UNIX.

3. Copy the backed up Snap Creator 3.6.x database directory to the latest database location (`/install_path/scServer4.1.x/engine/snapcreator`).
4. Copy the backed up Snap Creator 3.6.x profiles and configuration folder to the latest location (`/install_path/scServer4.1.x/engine/configs`).
5. Copy the backed up Snap Creator 3.6.x logs folder to the latest location (`/install_path/scServer4.1.x/engine/logs`).
6. Change directories to the `engine` subdirectory in the Snap Creator install path (`/install_path/scServer4.1.x/engine`).
7. Upgrade the Snap Creator Server by entering the following command:

```
java -jar snapcreator.jar -upgrade
```

#### After you finish

After the upgrade process is complete, start the Snap Creator Server service by entering the following command:

```
/install_path/scServer4.1.x/bin/scServer start
```

Also, delete the Snap Creator 3.6.x install directory.

**Important:** Do not delete your backup copies until you are certain you do not need to revert to an older version.

You must also validate the Snap Creator Framework GUI startup by navigating to the local host on the specified port (`https://IP_address:gui_port`).

You must connect using HTTPS; otherwise, the connection is not automatically redirected to an HTTPS connection and the GUI will not work.

#### Related tasks

[Installing the Snap Creator Server on UNIX-based systems](#) on page 19

## Upgrading Snap Creator Agent 3.6.x on Windows

You can upgrade directly from Snap Creator Agent 3.6.x on Windows.

#### Before you begin

- You have stopped Snap Creator Agent service (`snapcreatoragentservice`) before backing up the Snap Creator Agent directories to ensure that the backed up data is complete.

For example, you can use the Services snap-in to stop the service:

1. Select **Start > Run** and enter `services.msc`.
2. Locate and select the Snap Creator Agent service; then, stop the service.

Alternatively, you can open a command prompt and enter the following command:

```
sc stop snapcreatoragentservice
```

- You have backed up the following directories, and all associated subdirectories and files, within the Snap Creator Agent directory (`C:\Program Files\NetApp\NetApp_Snap_Creator_Framework\scAgent3.6.x`):

- `agent.conf` file (`..\config\agent.conf`)

**Note:** If you have the Snap Creator Server installed on the same system, you might have already backed up this file when you upgraded the Snap Creator Server 3.6.x.

- Logs directory, if enabled (`..\logs`)
- Plug-ins directory (`..\plugins`)

### About this task

Snap Creator Agent in versions prior to 4.1 used a file named `agent.conf` to list commands outside of Snap Creator that might be executed on Snap Creator Agent. In 4.1, the `allowed_commands.config` file is used.

Similarly, the `agent.conf` file listed hosts that the Snap Creator Agent was allowed to communicate with. By default, the Snap Creator Agent allowed communications with all Snap Creator Servers. However, if you chose to use this feature in previous versions of Snap Creator, the `AUTHORIZED_HOSTS` parameter in the `agent.properties` file now replaces that feature.

**Note:** If you did not use these parameters, a simple installation of the new agent is all that is required.

The paths provided in the following steps refer to the default installation path for Windows. Path information might differ from your installation path if the defaults were not used.

### Steps

1. Stop the Snap Creator Agent service if you have not already done so.  
For information about stopping the service, see the details provided earlier in this topic.
2. Uninstall Snap Creator (for Windows) by selecting **Start > Programs > Snap Creator > Uninstall NetApp Snap Creator Framework**.  
For details, see the information about uninstalling Snap Creator on Windows.
3. Install the latest Snap Creator Agent.  
For details, see the information about installing Snap Creator Agent on Windows.
4. Open the backed up copy of the `agent.conf` file in a text editor.

### Example

Following is an example of `agent.conf`:

```
host: scServer@Tampico
command: sdcli.exe
```

5. Open the new `allowed_commands.config` file (`C:\Program Files\NetApp\Snap_Creator_Framework\scAgent4.1.x\etc\allowed_commands.config`) in a text editor and copy the command line from `agent.conf` into the `allowed_commands.config` file; however, due to the enhanced security in the latest Snap Creator, make sure that the command is fully qualified.

### Example

From the previous example, the `allowed_commands.config` file should contain the following:

```
command: "C:\Program Files\NetApp\SnapDrive\sdcli.exe"
```

**Note:** Because of the space between "Program Files", quotation marks must be included to encapsulate the command. If the command does not contain any spaces, then quotation marks are not needed.

You can add commands as needed, with each command on a separate line.

6. Save and close the file.
7. Open the `agent.properties` file (`C:\Program Files\NetApp\Snap_Creator_Framework\scAgent4.1.x\etc\agent.properties`) in a text editor and change the default entry of `AUTHORIZED_HOSTS=*` to reflect the host setting in the `agent.conf` file.

From the previous example, the `AUTHORIZED_HOSTS` parameter should contain the following:

```
AUTHORIZED_HOSTS=Tampico
```

Hosts can be added as needed, using commas to separate host names. Both host names and IP addresses are supported:

```
AUTHORIZED_HOSTS=Tampico, 10.10.10.192, Fuji01
```

8. Save and close the file.
9. Start the Snap Creator Agent service by doing one of the following:
  - Use the Services snap-in and start the service.
  - From a command prompt, enter the following command: `sc start snapcreatoragentservice`

#### Related tasks

[Installing the Snap Creator Agent on Windows](#) on page 23

[Uninstalling Snap Creator on Windows](#) on page 51

## Upgrading the Snap Creator Agent 3.6.x on UNIX

You can upgrade directly from Snap Creator Agent 3.6.x on UNIX.

#### Before you begin

- You have stopped Snap Creator Agent before backing up the Snap Creator Agent directories to ensure that the backed up data is complete.

For example, enter the following command:

```
/install_path/scAgent3.6.x/bin/scAgent stop
```

- You have backed up the following directories, and all associated subdirectories and files, within the Snap Creator Agent directory (`/install_path/scAgent3.6.x`):
  - `agent.conf` file (`./config/agent.conf`)
  - Logs directory, if enabled (`./logs`)
  - Plug-ins directory (`./plugins`)

**About this task**

The Snap Creator Agent in versions prior to 4.1 used a file named `agent.conf` to list commands outside of Snap Creator that could be executed on a Snap Creator Agent. In 4.1, the `allowed_commands.config` file is used.

Similarly, the `agent.conf` file listed hosts that the Snap Creator Agent was allowed to communicate with. By default, the Snap Creator Agent allowed communications with all Snap Creator Servers. However, if you chose to use this feature in previous versions of Snap Creator, the `AUTHORIZED_HOSTS` parameter in the `agent.properties` file now replaces that feature.

**Note:** If you did not use these parameters, a simple installation of the new agent is all that is required.

The paths provided in the following steps refer to the default installation path. The paths in the commands below might differ from those in your installation path.

**Steps**

1. Stop Snap Creator Agent if you have not already done so.  
For information, see the details provided earlier in this topic.
2. Install the latest Snap Creator Agent, but do not start the Snap Creator Agent.  
For details, see the information about installing Snap Creator Agent on UNIX.
3. Open the backed up copy of the `agent.conf` file in a text editor.

**Example**

The following is an example of `agent.conf`:

```
host: scServer@Lyon
command: rc_domino
```

4. Open the new `allowed_commands.config` file (`/install_path/scAgent4.1.x/etc/allowed_commands.config`) in a text editor and copy the command line from `agent.conf` into the `allowed_commands.config` file; however, due to the enhanced security in the latest Snap Creator, make sure that the command is fully qualified.

**Example**

From the previous example, the `allowed_commands.config` file should contain the following:

```
command: /etc/init.d/rc_domino
```

**Note:** If the command contains any spaces, then you must encapsulate the command within quotation marks.

You can add commands as needed, with each command on a separate line.

Save and close the file after making changes.

5. Open the `agent.properties` file (`/install_path/scAgent4.1.x/etc/agent.properties`) in a text editor and change the default entry of `AUTHORIZED_HOSTS=*` to reflect the host setting in the `agent.conf` file, then save and close the file.

From the previous example, the `AUTHORIZED_HOSTS` parameter should contain the following:

```
AUTHORIZED_HOSTS=Lyon
```

Hosts can be added as needed, using commas to separate host names. Both host names and IP addresses are supported:

```
AUTHORIZED_HOSTS=Lyon, 10.10.10.192, Fuji01
```

6. Start Snap Creator Agent by entering the following command:

```
/install_path/scAgent4.1.x/bin/scAgent start
```

#### Related tasks

[Installing the Snap Creator Agent on UNIX-based systems](#) on page 25

## Upgrading from Snap Creator 4.0.x

When you upgrade from Snap Creator 4.0.x, the database schema is upgraded.

### Upgrading Snap Creator Server 4.0.x on Windows

You can upgrade directly from Snap Creator Server 4.0.x on Windows.

#### Before you begin

- If you have any user names that contain special characters in Snap Creator, you must have renamed those users using only alphabetic characters (a through z and A through Z).
- You have stopped Snap Creator services (`snapcreatorserverservice` and `snapcreatoragentservice`) before backing up the Snap Creator directories to ensure that the backed up data is complete.

For example, you can use the Services snap-in to stop the services:

1. Select **Start > Run** and enter `services.msc`.
2. Locate and select the Snap Creator service; then, stop the service.

Alternatively, you can open a command prompt and enter the following commands:

```
sc stop snapcreatorserverservice
sc stop snapcreatoragentservice
```

- You have backed up the following directories, and all associated subdirectories and files, must have been backed up within the Snap Creator 4.0.x Server engine subdirectory (`C:\Program Files\NetApp\Snap_Creator_Framework\scServer4.0.x\engine`):
  - Snap Creator database (`..\snapcreator`)
  - Snap Creator Server properties (`..\etc`)
  - Profiles and configuration (`..\configs`)
  - Logs (`..\logs`)

**Note:** You must not have deleted the Snap Creator 4.0.x backup copies that you created.
- (Optional) If the Snap Creator Agent is installed on the same host as the Snap Creator Server, you should have already backed up the `agent.conf` file (`C:\Program Files\NetApp\Snap_Creator_Framework\scAgent4.0.x\config\agent.conf`).

**About this task**

The paths provided in the following steps refer to the default installation path for Windows. Path information might differ from your installation path if the defaults were not used.

After the upgrade process is complete, consider the following issues:

- If the Snap Creator database that is upgraded contains some tasks marked as “in progress”, the state remains the same even after the upgrade process is complete.
- The default administrator in the latest Snap Creator must be an administrator in Snap Creator 4.0.x. If the 4.0.x user is not an administrator, then the upgrade assigns an operator role to the 4.0.x user.

**Steps**

1. Stop the Snap Creator services if you have not already done so.  
For information about stopping the services, see the details provided earlier in this topic.
2. Uninstall Snap Creator (for Windows) by selecting **Start > Programs > Snap Creator > Uninstall NetApp Snap Creator Framework**.  
For details, see the information about uninstalling Snap Creator on Windows.
3. Install the latest Snap Creator Server.  
For details, see the information about installing the Snap Creator Server on Windows.
4. If you selected to start the Snap Creator Server as a service when you installed the latest Snap Creator Server, then stop the service.  
For information about stopping the service, see the details provided earlier in this topic.
5. Delete the latest Snap Creator Server database folder (C:\Program Files\NetApp\Snap\_Creator\_Framework\scServer4.1.x\engine\snapcreator).
6. Copy the backed up Snap Creator 4.0.x database directory to the latest location (C:\Program Files\NetApp\Snap\_Creator\_Framework\scServer4.1.x\engine\snapcreator).
7. Copy the backed up Snap Creator 4.0.x profiles and configuration directory to the latest location (C:\Program Files\NetApp\Snap\_Creator\_Framework\scServer4.1.x\engine\configs).
8. Copy the backed up Snap Creator 4.0.x logs directory to the latest location (C:\Program Files\NetApp\Snap\_Creator\_Framework\scServer4.1.x\engine\logs).
9. Open a command prompt and change the directory to the engine subdirectory in the Snap Creator install path (C:\Program Files\NetApp\Snap\_Creator\_Framework\scServer4.1.x\engine).
10. Upgrade Snap Creator by entering the following command:

```
java -jar snapcreator.jar -upgrade
```

**After you finish**

After the upgrade process is complete, start the Snap Creator Server service by doing one of the following:

- Use the Services snap-in and start the service.
- From a command prompt, enter the following command: `sc start snapcreatorserverservice`

Also, you must validate the Snap Creator Framework GUI startup by navigating to the local host on the specified port (`https://IP_address:gui_port`).

You must connect using HTTPS; otherwise, the connection is not automatically redirected to an HTTPS connection and the GUI will not work.

### Related concepts

[Installing the Snap Creator Server](#) on page 16

### Related tasks

[Uninstalling Snap Creator on Windows](#) on page 51

## Upgrading Snap Creator Server 4.0.x on UNIX

You can upgrade directly from Snap Creator Server 4.0.x on UNIX.

### Before you begin

- If you have any user names that contain special characters in Snap Creator, you must have renamed those users using only alphabetic characters (a through z or A through Z).
- You have stopped the Snap Creator processes before backing up the Snap Creator directories to ensure that the backed up data is complete.

For example, enter the following commands:

```
/install_path/scServer4.0.x/bin/scServer stop
/install_path/scAgent4.0.x/bin/scAgent stop
```

- You have backed up the following directories, and all associated subdirectories and files, within the Snap Creator 4.0.x Server engine subdirectory (`/install_path/scServer4.0.x/engine`):
  - Snap Creator database (`../snapcreator`)
  - Snap Creator Server properties (`../etc`)
  - Profiles and configuration (`../configs`)
  - Logs (`../logs`)

**Note:** You must not have deleted the Snap Creator 4.0.x backup copies that you created.

### About this task

The paths provided in the following steps refer to the default installation path. The paths in the commands below might differ from your installation path.

After the upgrade process is complete, you should consider the following issues:

- If the Snap Creator database that is upgraded contains some tasks marked as "in progress," then the state remains the same even after the upgrade process is complete.
- The default administrator in the latest Snap Creator must be an administrator in Snap Creator 4.0.x. If the 4.0.x user is not an administrator, then the upgrade assigns an operator role to the 4.0.x user.

### Steps

1. Stop the Snap Creator processes if you have not already done so.

For information about stopping the processes, see the details provided earlier in this topic.

2. Install the latest Snap Creator, but do not start the Snap Creator Server service.  
For details, see information about installing the Snap Creator Server on UNIX.
3. Copy the backed up Snap Creator 4.0.x database directory to the latest location (`/install_path/scServer4.1.x/engine/snapcreator`).
4. Copy the backed up 4.0.x profiles and configuration directory to the latest location (`/install_path/scServer4.1.x/engine/configs`).
5. Copy the backed up 4.0.x logs directory to the latest location (`/install_path/scServer4.1.x/engine/logs`).
6. Change directories to the `engine` subdirectory in the Snap Creator install path (`/install_path/scServer4.1.x/engine`).
7. Upgrade Snap Creator Server by entering the following command:

```
java -jar snapcreator.jar -upgrade
```

#### After you finish

After the upgrade process is complete, start the Snap Creator Server service by entering the following command:

```
/install_path/scServer4.1.x/bin/scServer start
```

Also, delete the Snap Creator 4.0 installation directory.

**Important:** Do not delete your backup copies until you are certain that you do not need to revert to an older version.

You must also validate the Snap Creator Framework GUI startup by navigating to the local host on the specified port (`https://IP_address:gui_port`).

You must connect using HTTPS; otherwise, the connection is not automatically redirected to an HTTPS connection and the GUI will not work.

#### Related tasks

[Installing the Snap Creator Server on UNIX-based systems](#) on page 19

## Upgrading Snap Creator Agent 4.0.x on Windows

You can upgrade directly from Snap Creator Agent 4.0.x on Windows.

#### Before you begin

- You have stopped Snap Creator Agent service (`snapcreatoragentservice`) before backing up the Snap Creator Agent directories to ensure that the backed up data is complete.

For example, you can use the Services snap-in to stop the service:

1. Select **Start > Run** and enter `services.msc`.
2. Locate and select the Snap Creator Agent service; then, stop the service.

Alternatively, you can open a command prompt and enter the following command:

```
sc stop snapcreatoragentservice
```

- You have backed up the following directories, and all associated subdirectories and files, within the Snap Creator Agent directory (C:\Program Files\NetApp\NetApp\_Snap\_Creator\_Framework\scAgent4.0.x):
  - agent.conf file (. .\config\agent.conf)
 

**Note:** If you have Snap Creator Server installed on the same system, you might have already backed up this file when you upgraded Snap Creator Server 4.0.x.
  - Logs directory, if enabled (. .\logs)
  - Plug-ins directory (. .\plugins)

### About this task

Snap Creator Agent in versions prior to 4.1 used a file named `agent.conf` to list commands outside of Snap Creator that might be executed on Snap Creator Agent. In 4.1, the `allowed_commands.config` file is used.

Similarly, the `agent.conf` file listed hosts that Snap Creator Agent was allowed to communicate with. By default, Snap Creator Agent allowed communications with all Snap Creator Servers. However, if you chose to use this feature in previous versions of Snap Creator, the `AUTHORIZED_HOSTS` parameter in the `agent.properties` file now replaces that feature.

**Note:** If you did not use these parameters, a simple installation of the new agent is all that is required.

The paths provided in the following steps refer to the default installation path for Windows. Path information might differ from your install path if the defaults were not used.

### Steps

1. Stop the Snap Creator Agent service if you have not already done so.
 

For information about stopping the service, see the details provided earlier in this topic.
2. Uninstall Snap Creator (for Windows) by selecting **Start > Programs > Snap Creator > Uninstall NetApp Snap Creator Framework**.
 

For details, see information about uninstalling Snap Creator on Windows.
3. Install the latest Snap Creator Agent.
 

For details, see the information about installing the Snap Creator Agent on Windows.
4. Open the backed up copy of the `agent.conf` file in a text editor.

### Example

Following is an example of `agent.conf`:

```
host: scServer@Tampico
command: sdcli.exe
```

5. Open the new `allowed_commands.config` file (C:\Program Files\NetApp\Snap\_Creator\_Framework\scAgent4.1.x\etc\allowed\_commands.config) in a text editor and copy the command line from `agent.conf` into the `allowed_commands.config` file; however, due to the enhanced security in the latest Snap Creator, make sure that the command is fully qualified.

**Example**

From the previous example, the `allowed_commands.config` file should contain the following:

```
command: "C:\Program Files\NetApp\SnapDrive\sdcli.exe"
```

**Note:** Because of the space between "Program Files", quotation marks must be included to encapsulate the command. If the command does not contain any spaces, then quotation marks are not needed.

You can add commands as needed, with each command on a separate line.

6. Save and close the file.
7. Open the `agent.properties` file (`C:\Program Files\NetApp\Snap_Creator_Framework\scAgent4.1.x\etc\agent.properties`) in a text editor and change the default entry of `AUTHORIZED_HOSTS=*` to reflect the host setting in the `agent.conf` file.

**Example**

From the previous example, the `AUTHORIZED_HOSTS` parameter should contain the following:

```
AUTHORIZED_HOSTS=Tampico
```

Hosts can be added as needed, using commas to separate host names. Both host names and IP addresses are supported:

```
AUTHORIZED_HOSTS=Tampico, 10.10.10.192, Fuji01
```

8. Save and close the file.
9. Start the Snap Creator Agent service by doing one of the following:
  - Use the Services snap-in and start the service.
  - From a command prompt, enter the following command: `sc start snapcreatoragentservice`

**Note:** Any changes to the `allowed_commands.config` or `agent.properties` files require restarting Snap Creator Agent if it is running when the changes are made.

**Related tasks**

[Installing the Snap Creator Agent on Windows](#) on page 23

[Uninstalling Snap Creator on Windows](#) on page 51

**Upgrading the Snap Creator Agent 4.0.x on UNIX**

You can upgrade directly from Snap Creator Agent 4.0.x on UNIX.

**Before you begin**

- You have stopped Snap Creator Agent before backing up the Snap Creator Agent directories to ensure that the backed up data is complete.

For example, enter the following command:

```
/install_path/scAgent4.0.x/bin/scAgent stop
```

- You have backed up the following directories, and all associated subdirectories and files, within the Snap Creator Agent directory (*/install\_path/scAgent4.0.x*):
  - `agent.conf` file (*./config/agent.conf*)
  - Logs directory, if enabled (*./logs*)
  - Plug-ins directory (*./plugins*)

### About this task

Snap Creator Agent in versions prior to 4.1 used a file named `agent.conf` to list commands outside of Snap Creator that might be executed on Snap Creator Agent. In 4.1, the `allowed_commands.config` file is used.

Similarly, the `agent.conf` file listed hosts that Snap Creator Agent was allowed to communicate with. By default, Snap Creator Agent allowed communications with all Snap Creator Servers. However, if you chose to use this feature in previous versions of Snap Creator, the `AUTHORIZED_HOSTS` parameter in the `agent.properties` file replaces that feature.

**Note:** If you did not use these parameters, a simple installation of the new agent is all that is required.

The paths provided in the following steps refer to the default installation path. The paths in the commands below might differ from your installation path.

### Steps

1. Stop Snap Creator Agent if you have not already done so.  
For information, see the details provided earlier in this topic.
2. Install the latest Snap Creator Agent, but do not start the Snap Creator Agent.  
For details, see the information about installing Snap Creator Agent on UNIX.
3. Open the backed up copy of the `agent.conf` file in a text editor.

### Example

The following is an example of the `agent.conf` file:

```
host: scServer@Lyon
command: rc_domino
```

4. Open the new `allowed_commands.config` file (*/install\_path/scAgent4.1.x/etc/allowed\_commands.config*) in a text editor and copy the command line from `agent.conf` to the `allowed_commands.config` file; however, due to the enhanced security in the latest Snap Creator, make sure that the command is fully qualified.

### Example

From the previous example, the `allowed_commands.config` file should contain the following:

```
command: /etc/init.d/rc_domino
```

**Note:** If the command contains any spaces, then you must encapsulate the command within quotation marks.

You can add commands as needed, with each command on a separate line.

Save and close the file after making changes.

5. Open the `agent.properties` file (`/install_path/scAgent4.1.x/etc/agent.properties`) in a text editor and change the default entry of `AUTHORIZED_HOSTS=*` to reflect the host setting in the `agent.conf` file.

### Example

From the previous example, the `AUTHORIZED_HOSTS` parameter should contain the following:

```
AUTHORIZED_HOSTS=Lyon
```

Hosts can be added as needed, using commas to separate host names. Both host names and IP addresses are supported:

```
AUTHORIZED_HOSTS=Lyon, 10.10.10.192, Fuji01
```

Save and close the file after making changes.

6. Start Snap Creator Agent by entering the following command:

```
/install_path/scAgent4.1.x/bin/scAgent start
```

**Note:** Any changes to the `allowed_commands.config` or `agent.properties` files require restarting the Snap Creator Agent if it is running when the changes are made.

### Related tasks

[Installing the Snap Creator Agent on UNIX-based systems](#) on page 25

## Upgrading from Snap Creator 4.1.x

You can upgrade from Snap Creator 4.1.x, including all currently available patch levels.

### Upgrading Snap Creator Server 4.1.x on Windows

You can upgrade from Snap Creator Server 4.1.x on Windows.

#### Before you begin

- You have stopped Snap Creator services (`snapcreatorserverservice` and `snapcreatoragentservice`) before backing up the Snap Creator directories to ensure that the backed up data is complete.

For example, you can use the Services snap-in to stop the services:

1. Select **Start > Run** and enter `services.msc`.
2. Locate and select the Snap Creator service; then, stop the service.

Alternatively, you can open a command prompt and enter the following commands:

```
sc stop snapcreatorserverservice
sc stop snapcreatoragentservice
```

- You have backed up the following directories, and all associated subdirectories and files, within the Snap Creator 4.1.x Server engine subdirectory (C:\Program Files\NetApp\Snap\_Creator\_Framework\scServer4.1.x\engine):
  - Snap Creator database (. .\snapcreator)
  - Snap Creator Server properties (. .\etc)
  - Configuration files (. .\configs)
  - Logs (. .\logs)
  - Plug-in repository, if enabled (. .\snapcreatorPlugin)
- (Optional) If the Snap Creator Agent is installed on the same host as the Snap Creator Server, you should back up the following directories and all associated subdirectories and files within the Snap Creator Agent directory (C:\Program Files\NetApp\Snap\_Creator\_Framework\scAgent4.1.x):
  - Snap Creator Agent properties (. .\etc), which contains the `allowed_commands.config` and `agent.properties` files
  - Logs (. .\logs)
  - Plug-ins (. .\plugins)
- If Snap Creator was manually started from a command prompt, you must close the command prompt and stop it.
 

**Note:** If Snap Creator was started from a service, the uninstaller stops the service as part of the uninstall process.

### About this task

The paths provided in the following steps refer to the default installation path for Windows. Path information might differ from your installation path if the defaults were not used.

After the upgrade process is complete, consider the following issues:

- If the Snap Creator database that is upgraded contains some tasks marked as “in progress”, the state remains the same even after the upgrade process is complete.
- The default administrator in the latest Snap Creator must be an administrator in Snap Creator 4.1. If the 4.1.x user is not an administrator, then the upgrade assigns an operator role to the 4.1.x user.

### Steps

1. Stop the Snap Creator services if you have not already done so.
 

For information about stopping the services, refer to the details provided earlier in this topic.
2. Uninstall Snap Creator (for Windows) by selecting **Start > Programs > Snap Creator > Uninstall NetApp Snap Creator Framework**.
 

For details, see the information about uninstalling Snap Creator on Windows.
3. Install the latest Snap Creator Server.
 

For details, see the information about installing the Snap Creator Server on Windows.
4. If you chose to start the Snap Creator Server as a service when you installed the latest Snap Creator Server, then stop the service.
 

For information about stopping the service, refer to the details provided earlier in this topic.

5. Delete the latest Snap Creator Server database folder at `C:\Program Files\NetApp\Snap_Creator_Framework\scServer4.1.x\engine\snapcreator`).
6. Copy the backed-up Snap Creator 4.1 database directory to the latest location at `C:\Program Files\NetApp\Snap_Creator_Framework\scServer4.1.x\engine\snapcreator`).
7. Copy the backed-up Snap Creator 4.1 configuration directory to the latest location at `C:\Program Files\NetApp\Snap_Creator_Framework\scServer4.1.x\engine\configs`).
8. Copy the backed-up Snap Creator 4.1 logs directory to the latest location at `C:\Program Files\NetApp\Snap_Creator_Framework\scServer4.1.x\engine\logs`).
9. Open a command prompt and change the directory to the engine subdirectory in the Snap Creator install path at `C:\Program Files\NetApp\Snap_Creator_Framework\scServer4.1.x\engine`).
10. Upgrade Snap Creator by entering the following command:

```
java -jar snapcreator.jar -upgrade
```

#### After you finish

After the upgrade process is complete, start the Snap Creator Server service by doing one of the following:

- Use the Services snap-in and start the service.
- From a command prompt, enter the following command:

```
sc start snapcreatorserverservice
```

Also, you must validate the Snap Creator Framework GUI startup by navigating to the local host on the specified port (`https://IP_address:gui_port`).

You must connect using HTTPS; otherwise, the connection is not automatically redirected to an HTTPS connection and the GUI will not work.

## Upgrading Snap Creator Server 4.1.x on UNIX-based systems

You can upgrade from Snap Creator Server 4.1.x on UNIX-based systems.

#### Before you begin

- You have stopped the Snap Creator processes before backing up the Snap Creator directories to ensure that the backed-up data is complete.

For example, enter the following commands:

```
/install_path/scServer4.1.0/bin/scServer stop
/install_path/scAgent4.1.0/bin/scAgent stop
```

- You have backed up the following directories, and all associated subdirectories and files, within the Snap Creator 4.1.x Server engine subdirectory (`/install_path/scServer4.1.x/engine`):
  - Snap Creator database (`./snapcreator`)
  - Snap Creator Server properties (`./etc`)
  - Configuration files (`./configs`)

- Logs (`../logs`)
- Plug-in repository, if enabled (`../snapcreatorPlugin`)

**Note:** Do not delete the Snap Creator 4.1.x backup copies that you created.

### About this task

The paths provided in the following steps refer to the default installation path. Path information might differ from your installation path if the defaults were not used.

After the upgrade process is complete, you should consider the following issues:

- If the Snap Creator database that is upgraded contains some tasks marked as “in progress”, the state remains the same even after the upgrade process is complete.
- The default administrator in the latest Snap Creator must be an administrator in Snap Creator 4.1.x.  
If the 4.1.x user is not an administrator, then the upgrade assigns an operator role to the 4.1.x user.

### Steps

1. Stop the Snap Creator processes if you have not already done so.  
For information about stopping the processes, refer to the details provided earlier in this topic.
2. Install the latest version of Snap Creator, but do not start Snap Creator Server.  
For details, see the information about installing Snap Creator Server on UNIX.
3. Copy the backed-up Snap Creator 4.1.x database directory to the latest location at `/install_path/scServer4.1.x/engine/snapcreator`.
4. Copy the backed-up 4.1.x configuration directory to the latest location at `/install_path/scServer4.1.x/engine/configs`.
5. Copy the backed-up 4.1.x logs directory to the latest location at `/install_path/scServer4.1.x/engine/logs`.
6. Change directories to the `engine` subdirectory in the Snap Creator install path at `/install_path/scServer4.1.x/engine`.
7. Upgrade Snap Creator Server by entering the following command:

```
java -jar snapcreator.jar -upgrade
```

### After you finish

After the upgrade process is complete, start Snap Creator Server by entering the following command:

```
/install_path/scServer4.1.x/bin/scServer start
```

Also, delete the Snap Creator 4.1.x installation directory.

**Important:** Do not delete your backup copies until you are certain that you do not need to revert to an older version.

You must also validate the Snap Creator Framework GUI startup by navigating to the local host on the specified port (`https://IP_address:gui_port`).

You must connect using HTTPS; otherwise, the connection is not automatically redirected to an HTTPS connection and the GUI will not work.

## Upgrading Snap Creator Agent 4.1.x on Windows

You can upgrade from Snap Creator Agent 4.1.x on Windows.

### Before you begin

- You have stopped Snap Creator Agent service (`snapcreatoragentservice`) before backing up the Snap Creator Agent directories to ensure that the backed up data is complete. For example, you can use the Services snap-in to stop the service:

1. Select **Start > Run** and enter `services.msc`.
2. Locate and select the Snap Creator Agent service; then, stop the service.

Alternatively, you can open a command prompt and enter the following command:

```
sc stop snapcreatoragentservice
```

- You have backed up the following directories, and all associated subdirectories and files, within the Snap Creator Agent directory (`C:\Program Files\NetApp\NetApp_Snap_Creator_Framework\scAgent4.1.x`):
  - Snap Creator Agent properties (`..\etc`), which contains the `allowed_commands.config` and `agent.properties` files
  - Logs (`..\logs`)
  - Plug-ins (`..\plugins`)

**Note:** Do not delete the Snap Creator 4.1.x backup copies that you created.

### About this task

The paths provided in the following steps refer to the default installation path for Windows. Path information might differ from your installation path if the defaults were not used.

### Steps

1. Stop the Snap Creator Agent service if you have not already done so.  
For information about stopping the service, refer to the details provided earlier in this topic.
2. Uninstall Snap Creator (for Windows) by selecting **Start > Programs > Snap Creator > Uninstall NetApp Snap Creator Framework**.  
For details, see the information about uninstalling Snap Creator on Windows.
3. Install the latest Snap Creator Agent.  
For details, see the information about installing the Snap Creator Agent on Windows.
4. If you chose to start the Snap Creator Agent as a service when you installed the latest Snap Creator Server, then stop the service.  
For information about stopping the service, refer to the details provided earlier in this topic.
5. Copy the backed-up Snap Creator 4.1.x logs directory to the latest location (`C:\Program Files\NetApp\Snap_Creator_Framework\scAgent4.1.x\logs`).
6. Copy the backed-up Snap Creator 4.1.x plug-ins directory to the latest location (`C:\Program Files\NetApp\Snap_Creator_Framework\scAgent4.1.x\plugins`).

7. Copy the backed-up Snap Creator 4.1.x agent properties directory to the latest location (C:\Program Files\NetApp\Snap\_Creator\_Framework\scAgent4.1.x\etc).
8. Start the Snap Creator Agent service by doing one of the following:
  - Use the Services snap-in and start the service.
  - Enter the following at the command prompt:

```
sc start snapcreatoragentservice
```

**Note:** Any changes to the `allowed_commands.config` or `agent.properties` files require restarting Snap Creator Agent if it is running when the changes are made.

## Upgrading Snap Creator Agent 4.1.x on UNIX-based systems

You can upgrade from Snap Creator Agent 4.1.x on UNIX-based systems.

### Before you begin

- You have stopped Snap Creator Agent before backing up the Snap Creator Agent directories to ensure that the backed-up data is complete.  
For example, enter the following command:

```
/install_path/scAgent4.1.0/bin/scAgent stop
```

- You have backed up the following directories, and all associated subdirectories and files, within the Snap Creator Agent directory (*/install\_path/scAgent4.1.x*):
  - Snap Creator Agent properties (*./etc*), which contains the `allowed_commands.config` and `agent.properties` files
  - Logs (*./logs*)
  - Plug-ins (*./plugins*)

**Note:** Do not delete the Snap Creator 4.1.x backup copies that you created.

### About this task

The paths provided in the following steps refer to the default installation path. Path information might differ from your installation path if the defaults were not used.

### Steps

1. Stop Snap Creator Agent if you have not already done so.  
For information, refer to the details provided earlier in this topic.
2. Install the latest Snap Creator Agent, but do not start the Snap Creator Agent.  
For details, see the information about installing Snap Creator Agent on UNIX.
3. Copy the backed-up Snap Creator 4.1.x logs directory to the latest location at */install\_path/scAgent4.1.x/logs*.
4. Copy the backed-up Snap Creator 4.1.x plug-ins directory to the latest location at */install\_path/scAgent4.1.x/plugins*.
5. Copy the backed-up Snap Creator 4.1.x agent properties directory to the latest location at */install\_path/scAgent4.1.x/etc*.

6. Start Snap Creator Agent by entering the following command:

```
/install_path/scAgent4.1.x/bin/scAgent start
```

**Note:** Any changes to the `allowed_commands.config` or `agent.properties` files require you to restart the Snap Creator Agent if it is running when the changes are made.

# Uninstalling Snap Creator

---

You can uninstall Snap Creator from your Windows and UNIX systems.

## Uninstalling Snap Creator on Windows

You can uninstall Snap Creator using the Windows **Start** menu. The Windows uninstaller removes the Snap Creator components that are installed (for example, if both the Snap Creator Server and Snap Creator Agent are installed, both will be uninstalled). Similarly, if only one of the components is installed, that component will be uninstalled.

### Before you begin

- Back up the following directories and all associated subdirectories and files, within the Snap Creator Server engine directory (C:\Program Files\NetApp\Snap\_Creator\_Framework\scServer4.1.0\engine):
  - Snap Creator database (. . \snapcreator)
  - Snap Creator Server properties (. . \etc)
  - Configuration files (. . \configs)
  - Logs (. . \logs)
  - Plug-in repository, if enabled (. . \snapcreatorPlugin)
- Back up the following directories and all associated subdirectories and files within the Snap Creator Agent directory (C:\Program Files\NetApp\Snap\_Creator\_Framework\scAgent4.1.0):
  - Logs (. . \logs)
  - Plug-ins (. . \plugins)
  - Snap Creator Agent properties (. . \etc), which contains the `allowed_commands.config` and `agent.properties` files
- If Snap Creator was manually started from a command prompt, stop and quit Snap Creator by closing the command prompt.

**Note:** If Snap Creator was started from a service, the uninstaller stops the service as part of the uninstall process.

### Steps

1. Select **Start > All programs > Snap Creator > Uninstall NetApp Snap Creator Framework**.
2. Click **Yes** when you are prompted as to whether you backed up the log and configurations files before uninstalling Snap Creator.
3. Click **Close** when prompted after the uninstall process is complete.

## Uninstalling Snap Creator on UNIX

When uninstalling Snap Creator on UNIX, first uninstall the Snap Creator Agent, then uninstall the Snap Creator Server.

### Uninstalling Snap Creator Agent on UNIX

You can uninstall Snap Creator Agent from UNIX by deleting the Snap Creator Agent installation folder.

#### Before you begin

Back up the following directories, and all associated subdirectories and files, within the Snap Creator Agent directory (*/install\_path/scAgent4.1.0*):

- Logs (*./logs*)
- Plug-ins (*./plugins*)
- Snap Creator Agent properties (*./etc*), which contains the *allowed\_commands.config* and *agent.properties* files

#### About this task

To uninstall the Snap Creator Agent, perform the following steps.

**Note:** The paths provided in the following steps refer to the generic installation path. You can modify the path in these commands to reflect the customized Snap Creator Agent installation path.

#### Steps

1. Stop the Snap Creator Agent by using the following script:

```
/install_path/scAgent4.1.0/bin/scAgent stop
```

2. Delete the Snap Creator Agent installation folder.

For example, on a Linux system, run the following command:

```
rm -rf /install_path/scAgent4.1.0
```

### Uninstalling Snap Creator Server on UNIX

You can uninstall Snap Creator Server from UNIX by deleting the Snap Creator Server installation folder.

#### Before you begin

Back up the following directories, and all associated subdirectories and files, within the Snap Creator Server engine directory (*/install\_path/scServer4.1.0/engine*):

- Snap Creator database (*./snapcreator*)
- Snap Creator Server properties (*./etc*)
- Configuration (*./configs*)
- Logs (*./logs*)

- Plug-in repository, if enabled (`../snapcreatorPlugin`)

**Note:** Make sure you back up these directories; otherwise, you will lose the user data and it will not be recoverable.

### About this task

To uninstall the Snap Creator Server, perform the following steps.

**Note:** The paths provided in the following steps refer to the generic installation path. You can modify the path in these commands to reflect the customized Snap Creator Server installation path.

### Steps

1. Stop the Snap Creator Server service (`snapcreatorserverservice`) by using the following script:

```
/install_path/scServer4.1.0/bin/scServer stop
```

2. Delete the Snap Creator Server installation folder.

For example, for a Linux system, run the following command:

```
rm -rf /install_path/scServer4.1.0
```

## CLI reference

---

This section contains reference information for using Snap Creator from the command line interface.

### CLI commands for creating a role for a Snap Creator user in clustered Data ONTAP

While creating a Snap Creator user in clustered Data ONTAP, you must create a role for a new cluster user or SVM user by running various commands.

#### CLI commands for creating cluster roles

The following table lists the commands that are required to create a role for a new cluster user.

| Command directory name | Command to be run  |
|------------------------|--|
| cluster identity show  | <code>role create -role CRBAC_New -cmddirname "cluster identity show" -vserver clus3240rre</code>      |
| event                  | <code>role create -role CRBAC_New -cmddirname "event" -vserver clus3240rre</code>                      |
| event config           | <code>role create -role CRBAC_New -cmddirname "event config" -vserver clus3240rre</code>               |
| event destination      | <code>role create -role CRBAC_New -cmddirname "event destination" -vserver clus3240rre</code>          |
| event log              | <code>role create -role CRBAC_New -cmddirname "event log" -vserver clus3240rre</code>                  |
| event mailhistory      | <code>role create -role CRBAC_New -cmddirname "event mailhistory" -vserver clus3240rre</code>          |
| event route            | <code>role create -role CRBAC_New -cmddirname "event route" -vserver clus3240rre</code>                |
| event snmphistory      | <code>role create -role CRBAC_New -cmddirname "event snmphistory" -vserver clus3240rre</code>          |
| event status           | <code>role create -role CRBAC_New -cmddirname "event status" -vserver clus3240rre</code>               |
| fcp                    | <code>role create -role CRBAC_New -cmddirname "fcp" -vserver Snapcreator -vserver clus3240rre</code>   |
| iscsi                  | <code>role create -role CRBAC_New -cmddirname "iscsi" -vserver Snapcreator -vserver clus3240rre</code> |
| lun comment            | <code>role create -role CRBAC_New -cmddirname "lun comment" -vserver clus3240rre</code>                |
| lun create             | <code>role create -role CRBAC_New -cmddirname "lun create" -vserver clus3240rre</code>                 |

| Command directory name   | Command to be run  |
|--------------------------|--|
| lun delete               | <code>role create -role CRBAC_New -cmddirname "lun delete" -vserver clus3240rre</code>               |
| lun geometry             | <code>role create -role CRBAC_New -cmddirname "lun geometry" -vserver clus3240rre</code>             |
| lun igroup add           | <code>role create -role CRBAC_New -cmddirname "lun igroup add" -vserver clus3240rre</code>           |
| lun igroup create        | <code>role create -role CRBAC_New -cmddirname "lun igroup create" -vserver clus3240rre</code>        |
| lun igroup set           | <code>role create -role CRBAC_New -cmddirname "lun igroup set" -vserver clus3240rre</code>           |
| lun igroup show          | <code>role create -role CRBAC_New -cmddirname "lun igroup show" -vserver clus3240rre</code>          |
| lun map                  | <code>role create -role CRBAC_New -cmddirname "lun map" -vserver clus3240rre</code>                  |
| lun mapped show          | <code>role create -role CRBAC_New -cmddirname "lun mapped show" -vserver clus3240rre</code>          |
| lun modify               | <code>role create -role CRBAC_New -cmddirname "lun modify" -vserver clus3240rre</code>               |
| lun move                 | <code>role create -role CRBAC_New -cmddirname "lun move" -vserver clus3240rre</code>                 |
| lun offline              | <code>role create -role CRBAC_New -cmddirname "lun offline" -vserver clus3240rre</code>              |
| lun online               | <code>role create -role CRBAC_New -cmddirname "lun online" -vserver clus3240rre</code>               |
| lun resize               | <code>role create -role CRBAC_New -cmddirname "lun resize" -vserver clus3240rre</code>               |
| lun show                 | <code>role create -role CRBAC_New -cmddirname "lun show" -vserver clus3240rre</code>                 |
| lun unmap                | <code>role create -role CRBAC_New -cmddirname "lun unmap" -vserver clus3240rre</code>                |
| network                  | <code>role create -role CRBAC_New -cmddirname "network" -vserver clus3240rre</code>                  |
| network fcp adapter show | <code>role create -role CRBAC_New -cmddirname "network fcp adapter show" -vserver clus3240rre</code> |
| network interface show   | <code>role create -role CRBAC_New -cmddirname "network interface show" -vserver clus3240rre</code>   |
| nfs                      | <code>role create -role CRBAC_New -cmddirname "nfs" -vserver Snapcreator -vserver clus3240rre</code> |
| options                  | <code>role create -role CRBAC_New -cmddirname "options" -vserver clus3240rre</code>                  |

| <b>Command directory name</b>     | <b>Command to be run</b>   |
|-----------------------------------|--|
| security login role show          | role create -role CRBAC_New -cmddirname "security login role show" -vserver clus3240rre              |
| security login show               | role create -role CRBAC_New -cmddirname "security login show" -vserver clus3240rre                   |
| snapmirror                        | role create -role CRBAC_New -cmddirname "snapmirror" -vserver clus3240rre                            |
| storage aggregate                 | role create -role CRBAC_New -cmddirname "storage aggregate" -vserver clus3240rre                     |
| system license show               | role create -role CRBAC_New -cmddirname "system license show" -vserver clus3240rre                   |
| system node                       | role create -role CRBAC_New -cmddirname "system node" -vserver clus3240rre                           |
| system node autosupport           | role create -role CRBAC_New -cmddirname "system node autosupport" -vserver clus3240rre               |
| system node autosupport invoke    | role create -role CRBAC_New -cmddirname "system node autosupport invoke" -vserver clus3240rre        |
| system node show                  | role create -role CRBAC_New -cmddirname "system node show" -vserver clus3240rre                      |
| system node run                   | role create -role CRBAC_New -cmddirname "system node run" -vserver clus3240rre                       |
| system services ndmp              | role create -role CRBAC_New -cmddirname "system services ndmp" -vserver clus3240rre                  |
| version                           | role create -role CRBAC_New -cmddirname "version" -vserver clus3240rre                               |
| version                           | security login role create -role bainew1 -vserver SnapCreator -cmddirname "version" -access readonly |
| vserver export-policy rule create | role create -role CRBAC_New -cmddirname "vserver export-policy rule create" -vserver clus3240rre     |
| vserver export-policy rule show   | role create -role CRBAC_New -cmddirname "vserver export-policy rule show" -vserver clus3240rre       |
| vserver export-policy show        | role create -role CRBAC_New -cmddirname "vserver export-policy show" -vserver clus3240rre            |
| vserver fcp initiator show        | role create -role CRBAC_New -cmddirname "vserver fcp initiator show" -vserver clus3240rre            |
| vserver fcp show                  | role create -role CRBAC_New -cmddirname "vserver fcp show" -vserver clus3240rre                      |
| vserver fcp status                | role create -role CRBAC_New -cmddirname "vserver fcp status" -vserver clus3240rre                    |
| vserver iscsi connection show     | role create -role CRBAC_New -cmddirname "vserver iscsi connection show" -vserver clus3240rre         |

| Command directory name                  | Command to be run  |
|---|--|
| vserver iscsi interface accesslist add  | role create -role CRBAC_New -cmddirname "vserver iscsi interface accesslist add" -vserver clus3240rre  |
| vserver iscsi interface accesslist show | role create -role CRBAC_New -cmddirname "vserver iscsi interface accesslist show" -vserver clus3240rre |
| vserver iscsi nodename                  | role create -role CRBAC_New -cmddirname "vserver iscsi nodename" -vserver clus3240rre                  |
| vserver iscsi session show              | role create -role CRBAC_New -cmddirname "vserver iscsi session" show -vserver clus3240rre              |
| vserver iscsi show                      | role create -role CRBAC_New -cmddirname "vserver iscsi show" -vserver clus3240rre                      |
| vserver iscsi status                    | role create -role CRBAC_New -cmddirname "vserver iscsi status" -vserver clus3240rre                    |
| vserver nfs status                      | role create -role CRBAC_New -cmddirname "vserver nfs status" -vserver clus3240rre                      |
| vserver services unix-group create      | role create -role CRBAC_New -cmddirname "vserver services unix-group create" -vserver clus3240rre      |
| vserver services unix-user create       | role create -role CRBAC_New -cmddirname "vserver services unix-user create" -vserver clus3240rre       |
| vserver services unix-group show        | role create -role CRBAC_New -cmddirname "vserver services unix-group show" -vserver clus3240rre        |
| vserver services unix-user show         | role create -role CRBAC_New -cmddirname "vserver services unix-user show" -vserver clus3240rre         |
| vserver show                            | role create -role CRBAC_New -cmddirname "vserver show" -vserver clus3240rre                            |
| volume autosize                         | role create -role CRBAC_New -cmddirname "volume autosize" -vserver clus3240rre                         |
| volume clone create                     | role create -role CRBAC_New -cmddirname "volume clone create" -vserver clus3240rre                     |
| volume create                           | role create -role CRBAC_New -cmddirname "volume create" -vserver clus3240rre                           |
| volume destroy                          | role create -role CRBAC_New -cmddirname "volume destroy" -vserver clus3240rre                          |
| volume efficiency off                   | role create -role CRBAC_New -cmddirname "volume efficiency off" -vserver clus3240rre                   |
| volume efficiency on                    | role create -role CRBAC_New -cmddirname "volume efficiency on" -vserver clus3240rre                    |
| volume efficiency show                  | role create -role CRBAC_New -cmddirname "volume efficiency show" -vserver clus3240rre                  |
| volume efficiency start                 | role create -role CRBAC_New -cmddirname "volume efficiency start" -vserver clus3240rre                 |

| Command directory name      | Command to be run   |
|-----------------------------|---|
| volume file                 | <code>role create -role CRBAC_New -cmddirname "volume file" -vserver clus3240rre</code>                           |
| volume file clone create    | <code>role create -role CRBAC_New -cmddirname "volume file clone create" -vserver clus3240rre</code>              |
| volume file show-disk-usage | <code>role create -role bainew1 -vserver SnapCreator -cmddirname "volume file show-disk-usage" -access all</code> |
| volume modify               | <code>role create -role CRBAC_New -cmddirname "volume modify" -vserver clus3240rre</code>                         |
| volume offline              | <code>role create -role CRBAC_New -cmddirname "volume offline" -vserver clus3240rre</code>                        |
| volume show                 | <code>role create -role CRBAC_New -cmddirname "volume show" -vserver clus3240rre</code>                           |
| volume size                 | <code>role create -role CRBAC_New -cmddirname "volume size" -vserver clus3240rre</code>                           |
| volume snapshot create      | <code>role create -role CRBAC_New -cmddirname "volume snapshot create" -vserver clus3240rre</code>                |
| volume unmount              | <code>role create -role CRBAC_New -cmddirname "volume unmount" -vserver clus3240rre</code>                        |

## CLI commands for creating SVM roles

The following table lists the commands that are required to create a role for a new SVM user.

| Command directory name         | Command to be run  |
|--------------------------------|--|
| adduser                        | <code>role create -role VSERVERRBACROLE_New -cmddirname "adduser" -vserver Snapcreator</code>                        |
| event generate-autosupport-log | <code>role create -role VSERVERRBACROLE_New -cmddirname "event generate-autosupport-log" -vserver Snapcreator</code> |
| fcp                            | <code>role create -role VSERVERRBACROLE_New -cmddirname "fcp" -vserver Snapcreator</code>                            |
| iscsi                          | <code>role create -role VSERVERRBACROLE_New -cmddirname "iscsi" -vserver Snapcreator</code>                          |
| lun comment                    | <code>role create -role VSERVERRBACROLE_New -cmddirname "lun comment" -vserver Snapcreator</code>                    |
| lun create                     | <code>role create -role VSERVERRBACROLE_New -cmddirname "lun create" -vserver Snapcreator</code>                     |
| lun delete                     | <code>role create -role VSERVERRBACROLE_New -cmddirname "lun delete" -vserver Snapcreator</code>                     |
| lun geometry                   | <code>role create -role VSERVERRBACROLE_New -cmddirname "lun geometry" -vserver Snapcreator</code>                   |
| lun igroup add                 | <code>role create -role VSERVERRBACROLE_New -cmddirname "lun igroup add" -vserver Snapcreator</code>                 |

| Command directory name             | Command to be run  |
|------------------------------------|--|
| lun igroup create                  | <code>role create -role VSERVERRBACROLE_New -cmddirname "lun igroup create" -vserver Snapcreator</code>                  |
| lun igroup set                     | <code>role create -role VSERVERRBACROLE_New -cmddirname "lun igroup set" -vserver Snapcreator</code>                     |
| lun igroup show                    | <code>role create -role VSERVERRBACROLE_New -cmddirname "lun igroup show" -vserver Snapcreator</code>                    |
| lun map                            | <code>role create -role VSERVERRBACROLE_New -cmddirname "lun map" -vserver Snapcreator</code>                            |
| lun mapped show                    | <code>role create -role VSERVERRBACROLE_New -cmddirname "lun mapped show" -vserver Snapcreator</code>                    |
| lun modify                         | <code>role create -role VSERVERRBACROLE_New -cmddirname "lun modify" -vserver Snapcreator</code>                         |
| lun move                           | <code>role create -role VSERVERRBACROLE_New -cmddirname "lun move" -vserver Snapcreator</code>                           |
| lun offline                        | <code>role create -role VSERVERRBACROLE_New -cmddirname "lun offline" -vserver Snapcreator</code>                        |
| lun online                         | <code>role create -role VSERVERRBACROLE_New -cmddirname "lun online" -vserver Snapcreator</code>                         |
| lun resize                         | <code>role create -role VSERVERRBACROLE_New -cmddirname "lun resize" -vserver Snapcreator</code>                         |
| lun show                           | <code>role create -role VSERVERRBACROLE_New -cmddirname "lun show" -vserver Snapcreator</code>                           |
| lun unmap                          | <code>role create -role VSERVERRBACROLE_New -cmddirname "lun unmap" -vserver Snapcreator</code>                          |
| network                            | <code>role create -role VSERVERRBACROLE_New -cmddirname "network" -vserver SnapCreator</code>                            |
| network connections                | <code>role create -role VSERVERRBACROLE_New -cmddirname "network connections" -vserver SnapCreator</code>                |
| network connections active         | <code>role create -role VSERVERRBACROLE_New -cmddirname "network connections active" -vserver SnapCreator</code>         |
| network connections listening show | <code>role create -role VSERVERRBACROLE_New -cmddirname "network connections listening show" -vserver SnapCreator</code> |
| network interface                  | <code>role create -role VSERVERRBACROLE_New -cmddirname "network interface" -vserver SnapCreator</code>                  |
| network routing-groups             | <code>role create -role VSERVERRBACROLE_New -cmddirname "network routing-groups" -vserver SnapCreator</code>             |
| nfs                                | <code>role create -role VSERVERRBACROLE_New -cmddirname "nfs" -vserver Snapcreator</code>                                |
| options                            | <code>role create -role VSERVERRBACROLE_New -cmddirname "options" -vserver Snapcreator</code>                            |

| <b>Command directory name</b> | <b>Command to be run</b>   |
|-------------------------------|--|
| restore-file                  | <code>role create -role VSERVERRBACROLE_New -cmddirname "restore-file" -vserver Snapcreator</code>             |
| snapmirror                    | <code>role create -role VSERVERRBACROLE_New -cmddirname "snapmirror" -vserver SnapCreator</code>               |
| version                       | <code>role create -role VSERVERRBACROLE_New -cmddirname "version" -vserver Snapcreator</code>                  |
| volume                        | <code>role create -role VSERVERRBACROLE_New -cmddirname "volume"</code>  |
| volume autosize               | <code>role create -role VSERVERRBACROLE_New -cmddirname "volume autosize" -vserver Snapcreator</code>          |
| volume clone                  | <code>role create -role VSERVERRBACROLE_New -cmddirname "volume clone" -vserver Snapcreator</code>             |
| volume clone create           | <code>role create -role VSERVERRBACROLE_New -cmddirname "volume clone create" -vserver Snapcreator</code>      |
| volume create                 | <code>role create -role VSERVERRBACROLE_New -cmddirname "volume create" -vserver Snapcreator</code>            |
| volume destroy                | <code>role create -role VSERVERRBACROLE_New -cmddirname "volume destroy" -vserver Snapcreator</code>           |
| volume efficiency off         | <code>role create -role VSERVERRBACROLE_New -cmddirname "volume efficiency off" -vserver Snapcreator</code>    |
| volume efficiency on          | <code>role create -role VSERVERRBACROLE_New -cmddirname "volume efficiency on" -vserver Snapcreator</code>     |
| volume efficiency start       | <code>role create -role VSERVERRBACROLE_New -cmddirname "volume efficiency start" -vserver Snapcreator</code>  |
| volume efficiency show        | <code>role create -role VSERVERRBACROLE_New -cmddirname "volume efficiency show" -vserver Snapcreator</code>   |
| volume file                   | <code>role create -role VSERVERRBACROLE_New -cmddirname "volume file" -vserver Snapcreator</code>              |
| volume file clone             | <code>role create -role VSERVERRBACROLE_New -cmddirname "volume file clone" -vserver Snapcreator</code>        |
| volume file clone create      | <code>role create -role VSERVERRBACROLE_New -cmddirname "volume file clone create" -vserver Snapcreator</code> |
| volume modify                 | <code>role create -role VSERVERRBACROLE_New -cmddirname "volume modify" -vserver Snapcreator</code>            |
| volume mount                  | <code>role create -role VSERVERRBACROLE_New -cmddirname "volume mount" -vserver Snapcreator</code>             |
| volume offline                | <code>role create -role VSERVERRBACROLE_New -cmddirname "volume offline" -vserver Snapcreator</code>           |
| volume show                   | <code>role create -role VSERVERRBACROLE_New -cmddirname "volume show" -vserver Snapcreator</code>              |

| Command directory name                  | Command to be run  |
|---|--|
| volume size                             | role create -role VSERVERRBACROLE_New -cmddirname "volume size" -vserver Snapcreator                             |
| volume snapshot create                  | role create -role VSERVERRBACROLE_New -cmddirname "volume snapshot create" -vserver Snapcreator                  |
| volume snapshot delete                  | role create -role VSERVERRBACROLE_New -cmddirname "volume snapshot delete" -vserver Snapcreator                  |
| volume snapshot restore                 | role create -role VSERVERRBACROLE_New -cmddirname "volume snapshot restore" -vserver Snapcreator                 |
| volume unmount                          | role create -role VSERVERRBACROLE_New -cmddirname "volume unmount" -vserver Snapcreator                          |
| vserver export-policy rule show         | role create -role VSERVERRBACROLE_New -cmddirname "vserver export-policy rule show" -vserver Snapcreator         |
| vserver export-policy show              | role create -role VSERVERRBACROLE_New -cmddirname "vserver export-policy show" -vserver Snapcreator              |
| vserver fcp initiator show              | role create -role VSERVERRBACROLE_New -cmddirname "vserver fcp initiator show" -vserver Snapcreator              |
| vserver fcp show                        | role create -role VSERVERRBACROLE_New -cmddirname "vserver fcp show" -vserver Snapcreator                        |
| vserver fcp status                      | role create -role VSERVERRBACROLE_New -cmddirname "vserver fcp status" -vserver Snapcreator                      |
| vserver iscsi connection show           | role create -role VSERVERRBACROLE_New -cmddirname "vserver iscsi connection show" -vserver Snapcreator           |
| vserver iscsi interface accesslist add  | role create -role VSERVERRBACROLE_New -cmddirname "vserver iscsi interface accesslist add" -vserver Snapcreator  |
| vserver iscsi interface accesslist show | role create -role VSERVERRBACROLE_New -cmddirname "vserver iscsi interface accesslist show" -vserver Snapcreator |
| vserver iscsi isns query                | role create -role VSERVERRBACROLE_New -cmddirname "vserver iscsi isns query" -vserver Snapcreator                |
| vserver iscsi nodename                  | role create -role VSERVERRBACROLE_New -cmddirname "vserver iscsi nodename" -vserver Snapcreator                  |
| vserver iscsi session show              | role create -role VSERVERRBACROLE_New -cmddirname "vserver iscsi session show" -vserver Snapcreator              |
| vserver iscsi show                      | role create -role VSERVERRBACROLE_New -cmddirname "vserver iscsi show" -vserver Snapcreator                      |
| vserver iscsi status                    | role create -role VSERVERRBACROLE_New -cmddirname "vserver iscsi status" -vserver Snapcreator                    |
| vserver nfs status                      | role create -role VSERVERRBACROLE_New -cmddirname "vserver nfs status" -vserver Snapcreator                      |
| vserver services dns hosts show         | role create -role VSERVERRBACROLE_New -cmddirname "vserver services dns hosts show" -vserver SnapCreator         |

| <b>Command directory name</b>      | <b>Command to be run</b>  |
|------------------------------------|---|
| vserver services unix-group create | role create -role VSERVERRBACROLE_New -cmddirname "vserver services unix-group create" -vserver Snapcreator |
| vserver services unix-group show   | role create -role VSERVERRBACROLE_New -cmddirname "vserver services unix-group show" -vserver Snapcreator   |
| vserver services unix-user create  | role create -role VSERVERRBACROLE_New -cmddirname "vserver services unix-user create" -vserver Snapcreator  |
| vserver services unix-user show    | role create -role VSERVERRBACROLE_New -cmddirname "vserver services unix-user show" -vserver Snapcreator    |

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