SnapCenter® Software 4.2

Data Protection Guide

For Microsoft Windows® File Systems

n NetApp®

Contents

Deciding whether to read the SnapCenter Data Protection Guide for Windows File Systems

This guide describes how to use SnapCenter to perform backup, restore, and clone operations on Windows file systems.

You should read this information if you want to use SnapCenter in the following ways:

- You want to create data protection policies and resource groups for Windows file systems

- You want to perform backup, restore, or clone operations on Windows file systems using the graphical user interface (GUI)

- You want to perform backup, restore, or clone operations on Windows file systems using Windows PowerShell cmdlets

You should have already performed the following tasks:

- Installed SnapCenter Server and the SnapCenter Plug-in for Microsoft Windows

- Configured role-based access control (RBAC), storage system connections, and credentials

- Deployed the NetApp Data Broker virtual appliance, enabled the SnapCenter Plug-in for VMware vSphere, and registered the plug-in with SnapCenter, if you want to protect Windows file systems on virtual machines. The NetApp Data Broker, SnapCenter Plug-in for VMware vSphere, documentation has more information.
  Deployment Guide for SnapCenter Plug-in for VMware vSphere

- Set up SnapMirror and SnapVault relationships, if you want backup replication

You can also use the following information to help accomplish your data protection goals:

- SnapCenter Server and plug-in installation and setup
  Installing and setting up SnapCenter
  Getting Started

- SnapCenter concepts, including architecture, features, and benefits
  Concepts

- Other SnapCenter Data Protection Guides for specific types of resources, such as Microsoft SQL Server, Oracle, Windows file systems, and custom plug-ins

- SnapCenter PowerShell commands
  SnapCenter Software 4.2 Windows Cmdlet Reference Guide

- SnapCenter administration, including dashboards, reporting capabilities, and REST APIs, and managing licenses, storage connections, and the SnapCenter Server repository
  Performing administrative tasks

- The SnapCenter 4.1.1 documentation has information on protecting virtualized databases and file systems using the SnapCenter 4.1.1 Plug-in for VMware vSphere. The NetApp Data Broker, SnapCenter Plug-in for VMware vSphere, documentation has information on protecting virtualized databases and file systems using the Linux-based NetApp Data Broker virtual appliance (Open Virtual Appliance format) for SnapCenter 4.2.
  Data Protection Guide for VMs, Datastores, and VMDKs using the SnapCenter Plug-in for VMware vSphere

SnapCenter Plug-in for Microsoft Windows overview

The SnapCenter Plug-in for Microsoft Windows is a host-side component of the NetApp SnapCenter Software that enables application-aware data protection management of Microsoft file system resources. In addition, it provides storage provisioning, Snapshot copy consistency, and space reclamation for Windows file systems. The Plug-in for Windows automates file system backup, restore, and cloning operations in your SnapCenter environment.

When the Plug-in for Windows is installed, you can use SnapCenter with NetApp SnapMirror technology to create mirror copies of backup sets on another volume and with NetApp SnapVault technology to perform disk-to-disk backup replication for archival or standards compliance.

The Data Protection Guide for your plug-in has information about data protection operations.

The SnapCenter concepts documentation has information about the SnapCenter architecture, features, and benefits.

Related information

Concepts
Installing and setting up SnapCenter

SnapCenter Plug-in for Windows file systems data protection workflow

The data protection workflow lists the tasks that you have to perform for data protection.
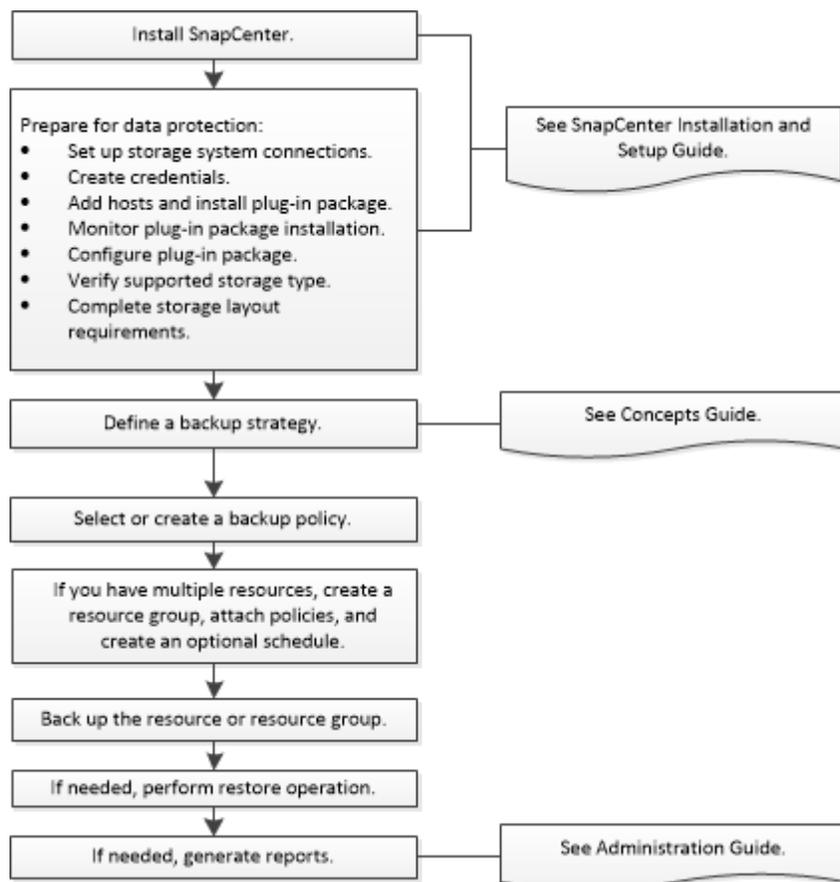
Related tasks

Restoring Windows file system backups on page 20
Cloning from a Windows file system backup on page 23

Related references

Backing up Windows file systems on page 8

Related information

Installing and setting up SnapCenter
Concepts
Performing administrative tasks

Backing up Windows file systems

When you install the SnapCenter Plug-in for Microsoft Windows in your environment, you can use SnapCenter to back up Windows file systems. You can back up a single file system or a resource group that contains multiple file systems. You can back up on demand or according to a defined protection schedule.

You can schedule multiple backups to run across servers simultaneously.

Backup and restore operations cannot be performed simultaneously on the same resource.

The following workflow shows the sequence in which you must perform the backup operations:

Define a backup strategy.

↓

Determine whether the resources are available for backup.

↓

Create a backup policy.

↓

If you have multiple resources, create a resource group, attach policies, and create an optional schedule.

↓

Back up the resource or resource group.

↓

Monitor the backup operation.

↓

View related backups in Topology page.
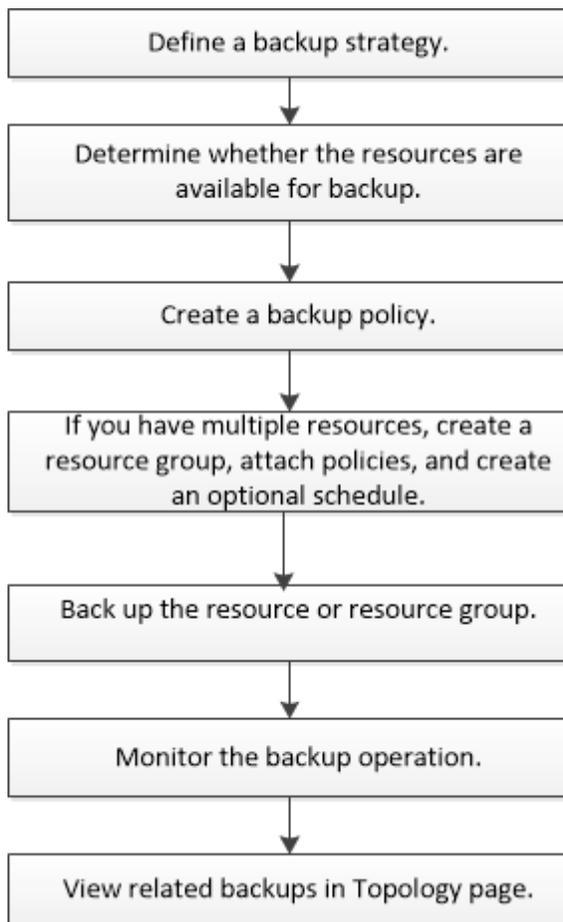
You can also use PowerShell cmdlets manually or in scripts to perform backup, restore, and clone operations. The SnapCenter cmdlet help or the cmdlet reference information contains detailed information about PowerShell cmdlets.

SnapCenter Software 4.2 Windows Cmdlet Reference Guide

Determining resource availability

Resources are the LUNs and similar components in your file system that are maintained by the plug-ins you have installed. You can add those resources to resource groups so that you can perform data

protection jobs on multiple resources, but first you must identify which resources you have available. Discovering available resources also verifies that the plug-in installation was completed successfully.

Before you begin

- You must have already completed tasks such as installing SnapCenter Server, adding hosts, creating storage virtual machine (SVM) connections, and adding credentials.

- If files reside on VMware RDM LUNs or VMDKs, you must have deployed the NetApp Data Broker virtual appliance, enabled the SnapCenter Plug-in for VMware vSphere, and registered the plug-in with SnapCenter. See the NetApp Data Broker, SnapCenter Plug-in for VMware vSphere, documentation.
  Deployment Guide for SnapCenter Plug-in for VMware vSphere

Steps

1. In the left navigation pane, click **Resources**, and then select the appropriate plug-in from the list.

2. In the **Resources** page, select **File Systems** from the list.

3. Select the host to filter the list of resources, and then click **Refresh Resources**.

   The newly added, renamed, or deleted file systems are updated to the SnapCenter Server inventory.

Viewing related backups and clones in the Topology page

When you are preparing to back up or clone a resource, you can view a graphical representation of all backups and clones on the primary and secondary storage. In the Topology page, you can see all of the backups and clones that are available for the selected resource or resource group. You can view the details of those backups and clones, and then select them to perform data protection operations.

About this task

You can review the following icons in the Manage Copies view to determine whether the backups and clones are available on the primary or secondary storage (Mirror copies or Vault copies).

- displays the number of backups and clones that are available on the primary storage.

- displays the number of backups and clones that are mirrored on the secondary storage using SnapMirror technology.

  Note: Clones of a backup of a version-flexible mirror on a mirror-vault type volume are displayed in the topology view but the mirror backup count in the topology view does not include the version-flexible backup.

- displays the number of backups and clones that are replicated on the secondary storage using SnapVault technology.

  ◦ The number of backups displayed includes the backups deleted from the secondary storage. For example, if you have created 6 backups using a policy to retain only 4 backups, the number of backups displayed are 6.

◦ If you have upgraded from SnapCenter 1.1, the clones on the secondary (mirror or vault) are not displayed under Mirror copies or Vault copies in the Topology page. All the clones created using SnapCenter 1.1 are displayed under the Local copies in SnapCenter 3.0.

Note: Clones of a backup of a version-flexible mirror on a mirror-vault type volume are displayed in the topology view but the mirror backup count in the topology view does not include the version-flexible backup.

Steps

1. In the left navigation pane, click **Resources**, and then select the appropriate plug-in from the list.

2. In the **Resources** page, either select the resource or resource group from the **View** drop-down list.

3. Select the resource either from the resource details view or from the resource group details view.

   If the resource is protected, the topology page of the selected resource is displayed.

4. Review the **Summary card** to see a summary of the number of backups and clones available on the primary and secondary storage.

   The Summary Card section displays the total number of backups and clones. For Oracle database only, the Summary Card section also displays the total number of log backups.

   Clicking the refresh button starts a query of the storage to display an accurate count.

5. In the **Manage Copies** view, click **Backups** or **Clones** from the primary or secondary storage to see details of a backup or clone.

   The details of the backups and clones are displayed in a table format.

6. Select the backup from the table, and then click the data protection icons to perform restore, clone, rename, and delete operations.

   Note: You cannot rename or delete backups that are on the secondary storage system.

   If you are using SnapCenter Custom Plug-ins, you cannot rename the backups that are on the primary storage system.

   • If you select a backup of an Oracle resource or resource group, you can also perform mount and unmount operations.

   • If you have selected a log backup of an Oracle resource or resource group, you can perform rename, mount, unmount, and delete operations.

   • If you are using SnapCenter Plug-ins Package for Linux and have cataloged the backup using Oracle Recovery Manager (RMAN), you cannot rename those cataloged backups.

7. If you want to delete a clone, then select the clone from the table and click 🗑 to delete the clone.

Example showing backups and clones on the primary storage

Manage Copies

2 Backups
1 Clones

Summary Card

2 Backups
1 Data Backups
1 Log Backups
1 Clones

Example showing backups on the primary and secondary storage
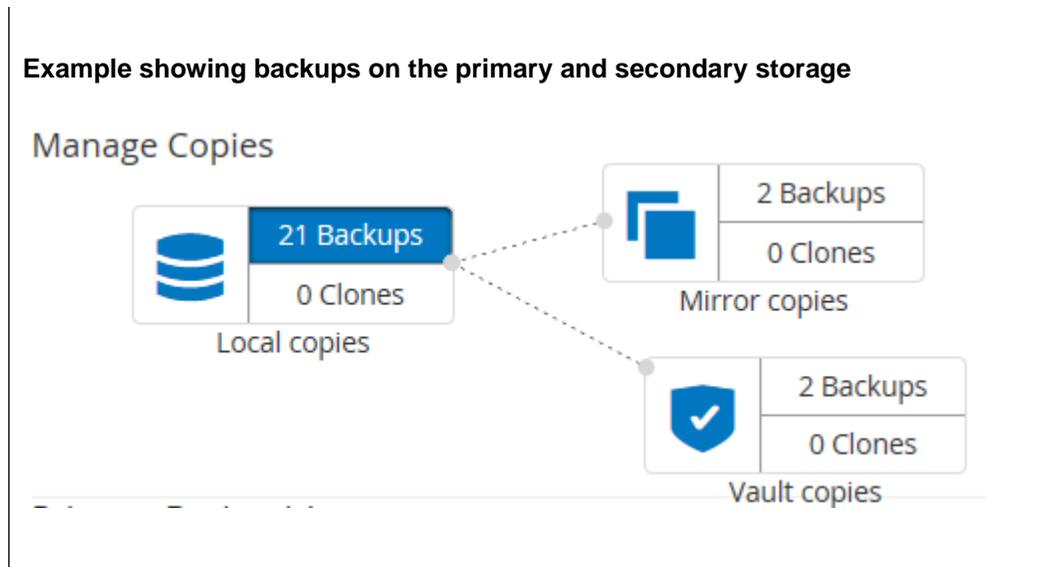
Creating backup policies for Windows file systems

You can create a new backup policy for resources before you use SnapCenter to back up Windows file systems, or you can create a new backup policy at the time you create a resource group or when you back up a resource.

Before you begin

- You must have defined your backup strategy.
  For details, see the information about defining a data protection strategy for Windows file systems.
  Concepts

- You must have prepared for data protection.
  To prepare for data protection, you must complete tasks such as installing SnapCenter, adding hosts, discovering resources, and creating storage virtual machine (SVM) connections.

- If you are replicating Snapshot copies to a mirror or vault secondary storage, the SnapCenter administrator must have assigned the SVMs to you for both the source and destination volumes.
  For information about how administrators assign resources to users, see the SnapCenter installation information.
  Installing and setting up SnapCenter

About this task

Most of the fields on these wizard pages are self-explanatory. The following information describes some of the fields for which you might require guidance.

Steps

1. In the left navigation pane, click **Settings**.

2. In the **Settings** page, click **Policies**.

3. To determine if you can use an existing policy, select the policy name and click **Details**.

   After reviewing the existing policies, you can perform one of the following:

   - Use an existing policy.

- Copy an existing policy and modify the policy configuration.

- Create a new policy.

4. To create a new policy, click **New**.

5. In the **Name** page, enter the policy name and a description.

6. In the **Backup Options** page, perform the following tasks:

   a. Select a backup setting.

Option	Description
File System Consistent Backup	Choose this option if you want SnapCenter to quiesce the disk drive on which the file system resides before the backup operation begins and then resume the disk drive after the backup operation ends.
File System Crash-consistent Backup	Choose this option if you do not want SnapCenter to quiesce the disk drive on which the file system resides.

   b. Select a schedule frequency (also called a *policy type*).

   The policy specifies the backup frequency only. The specific protection schedule for backing up is defined in the resource group. Therefore, two or more resource groups can share the same policy and backup frequency but have different backup schedules.

7. In the **Retention** page, specify the retention settings for on-demand backups and for each schedule frequency you selected.

Option	Description
Total Snapshot copies to retain	Choose this option if you want to specify the number of Snapshot copies SnapCenter stores before automatically deleting them.
Delete Snapshot copies older than	Choose this option if you want to specify the number of days SnapCenter retains a backup copy before deleting it.

   Important: You should set the retention count to 2 or higher if you plan to enable SnapVault replication. If you set the replication count to 1, the retention operation can fail. This is because the first Snapshot copy is the reference Snapshot copy for the SnapVault relationship until the newer Snapshot copy is replicated to the target.

   Note: The maximum retention value is 1018 for resources on ONTAP 9.4 or later, and 254 for resources on ONTAP 9.3 or earlier. Backups will fail if retention is set to a value higher than what the underlying ONTAP version supports.

8. In the **Replication** page, specify replication to the secondary storage system:

For this field…	Do this…
Update SnapMirror after creating a local Snapshot copy	Select this option to create mirror copies of backup sets on another volume (SnapMirror).
Update SnapVault after creating a Snapshot copy	Select this option to perform disk-to-disk backup replication.

For this field…	Do this…
Secondary policy label	Enter the frequency label for the secondary storage Snapshot copy. Every Snapshot copy has this label to distinguish it from the different groups on the secondary storage system. For example, Snapmirror Label: weekly is a frequency label.
Error retry count	Enter the number of replication attempts that should occur before the process halts.

9. Optional: In the **Script** page, enter the path of the prescript or postscript that you want the SnapCenter Server to run before or after the backup operation, respectively and a time limit that SnapCenter waits for the script to execute before timing out.

   For example, you can run a script to update SNMP traps, automate alerts, and send logs.

10. Review the summary, and then click **Finish**.

   Related information

   [Performing administrative tasks](#)
   [Installing and setting up SnapCenter](#)

Creating resource groups for Windows file systems

A resource group is the container to which you can add multiple file systems that you want to protect. You must also attach one or more policies to the resource group to define the type of data protection job that you want to perform, and then specify the backup schedule.

Steps

1. In the left navigation pane, click **Resources**, and then select the appropriate plug-in from the list.

2. In the **Resources** page, select **File Systems** from the list.

   Note: If you have recently added a file system to SnapCenter, click **Refresh Resources** to view the newly added resource.

3. Click **New Resource Group**.

4. On the **Name** page in the wizard, do the following:

For this field…	Do this…
Name	Enter the resource group name.
Use custom name format for Snapshot copy	Optional: Enter a custom Snapshot copy name and format. For example, customtext_resourcegroup_policy_hostname or resourcegroup_hostname. By default, a timestamp is appended to the Snapshot copy name.
Tag	Enter a descriptive tag to help when finding a resource group.

5. In the **Resources** page, perform the following tasks:

   a. Select the host to filter the list of resources.

      If you have recently added resources, they will appear on the list of available resources only after you refresh your resource list.

   b. In the **Available Resources** section, click the file systems that you want to back up, and then click the right arrow to move them to the **Added** section.

If you select the **Autoselect all resources on same storage volume** option, all of the resources on the same volume are selected. When you move them to the Added section, all of the resources on that volume move together.

To add a single file system, clear the **Autoselect all resources on same storage volume** option and then select the file systems you want to move to the Added section.

6. In the **Policies** page, perform the following tasks:

   a. Select one or more policies from the drop-down list.

   You can select any existing policy and click **Details** to determine whether you can use that policy.

   If no existing policy meets your requirements, you can create a new policy by clicking [+] to start the policy wizard.

   The selected policies are listed in the Policy column in the Configure schedules for selected policies section.

   b. In the **Configure schedules for selected policies** section, click [+] in the Configure Schedules column for the policy for which you want to configure the schedule.

   c. If the policy is associated with multiple schedule types (frequencies), select the frequency that you want to configure.

   d. In the **Add schedules for policy** *policyname* dialog box, configure the schedule by specifying the start date, expiration date, and frequency, and then click **Finish**.

   The configured schedules are listed in the Applied Schedules column in the Configure schedules for selected policies section.

7. In the **Notification** page, provide notification information, as follows:

For this field…	Do this…
Email preference	Select **Always**, **On Failure**, or **On failure or warning**, to send emails to recipients after creating backup resource groups, attaching policies, and configuring schedules. Enter the SMTP server, default email subject line, and the To and From email addresses.
From	Email address
To	Email to address
Subject	Default email subject line

8. Review the summary, and then click **Finish**.

   You can perform a backup on demand or wait for the scheduled backup to occur.

Related information

Performing administrative tasks

Backing up a single resource on demand

If a resource is not in a resource group, you can back up the resource on demand from the Resources page.

Before you begin

If you want to back up a resource that has a SnapMirror relationship with secondary storage, the role assigned to the storage user should include the "snapmirror all" privilege. However, if you are using the "vsadmin" role, then the "snapmirror all" privilege is not required.

About this task

> **Note:** When backing up a file system, SnapCenter does not back up LUNs that are mounted on a volume mount point (VMP) in the file system that is being backed up.

> **Attention:** If you are working in a Windows file system context, do not back up database files. Doing so creates an inconsistent backup and a possible loss of data when restoring. To protect database files, you must use the appropriate SnapCenter plug-in for the database (for example, SnapCenter Plug-in for Microsoft SQL Server, SnapCenter Plug-in for Microsoft Exchange Server, or a custom plug-in for database files).

Steps

1. In the left navigation pane, click **Resources**, and then select the appropriate plug-in from the list.

2. In the **Resources** page, select the File System resource type, and then select the resource that you want to back up.

3. If the **File System - Protect** wizard does not start automatically, click **Protect** to start the wizard.

   Specify the protection settings, as described in the Creating resource groups tasks.

4. Optional: In the **Resource** page of the wizard, enter a custom name format for the Snapshot copy.

   For example, customtext_resourcegroup_policy_hostname or resourcegroup_hostname. By default, a timestamp is appended to the Snapshot copy name.

5. In the **Policies** page, perform the following tasks:

   a. Select one or more policies from the drop-down list.

      You can select any existing policy, and then click **Details** to determine whether you can use that policy.

      If no existing policy meets your requirements, you can copy an existing policy and modify it

      or you can create a new policy by clicking ➕ to start the policy wizard.

      The selected policies are listed in the Policy column in the Configure schedules for selected policies section.

   b. In the **Configure schedules for selected policies** section, click ➕ in the Configure Schedules column for the policy for which you want to configure the schedule.

   c. In the **Add schedules for policy** *policyname* dialog box, configure the schedule by specifying the start date, expiration date, and frequency, and then click **Finish**.

      The configured schedules are listed in the Applied Schedules column in the Configure schedules for selected policies section.

6. In the **Notification** page, perform the following tasks:

For this field…	Do this…
Email preference	Select **Always**, or **On Failure**, or **On failure or warning**, to send emails to recipients after creating backup resource groups, attaching policies, and configuring schedules. Enter the SMTP server information, default email subject line, and the "To" and "From" email addresses.
From	Email address
To	Email to address
Subject	Default email subject line

7. Review the summary, and then click **Finish**.

8. Monitor the operation progress by clicking **Monitor > Jobs**.

Related tasks

Monitoring backup operations on page 17

Backing up resources using PowerShell cmdlets on page 28

Related information

SnapCenter Software 4.2 Windows Cmdlet Reference Guide

Backing up resource groups

A resource group is a collection of resources on a host or cluster. A backup operation on the resource group is performed on all resources defined in the resource group. You can back up a resource group on demand from the Resources page. If a resource group has a policy attached and a schedule configured, then backups occur automatically according to the schedule.

Before you begin

- You must have created a resource group with a policy attached.

- If you want to back up a resource that has a SnapMirror relationship to secondary storage, the role assigned to the storage user should include the "snapmirror all" privilege. However, if you are using the "vsadmin" role, then the "snapmirror all" privilege is not required.

About this task

Note: When backing up a file system, SnapCenter does not back up LUNs that are mounted on a volume mount point (VMP) in the file system that is being backed up.

Attention: If you are working in a Windows file system context, do not back up database files. Doing so creates an inconsistent backup and a possible loss of data when restoring. To protect database files, you must use the appropriate SnapCenter plug-in for the database (for example, SnapCenter Plug-in for Microsoft SQL Server, SnapCenter Plug-in for Microsoft Exchange Server, or a custom plug-in for database files).

Steps

1. In the left navigation pane, click **Resources**, and then select the appropriate plug-in from the list.

2. In the **Resources** page, select **Resource Group** from the **View** list.

You can search the resource group either by entering the resource group name in the search box or by clicking ▼ and selecting the tag. You can then click ▼ to close the filter pane.

3. In the **Resource Groups** page, select the resource group that you want to back up, and then click **Back up Now**.

   Note: For SnapCenter Plug-in for Oracle Database, if you have a federated resource group with two databases and one of the database has datafile on a non-NetApp storage, the backup operation is aborted even though the other database is on a NetApp storage.

4. In the **Backup** page, perform the following steps:

   a. If you have associated multiple policies with the resource group, from the **Policy** drop-down list, select the policy that you want to use for backup.

   b. Click **Backup**.

5. Monitor the operation progress by clicking **Monitor > Jobs**.

Related tasks

Creating resource groups for Windows file systems on page 13
Monitoring backup operations on page 17
Backing up resources using PowerShell cmdlets on page 28

Related information

SnapCenter Software 4.2 Windows Cmdlet Reference Guide

Monitoring backup operations

You can monitor the progress of different backup operations by using the SnapCenter Jobs page. You might want to check the progress to determine when it is complete or if there is an issue.

About this task

The following icons appear on the Jobs page and indicate the state of the operation:

- ◯ In progress

- ✔ Completed successfully

- ✖ Failed

- ⚠ Completed with warnings or could not start due to warnings

- ↺ Queued

- ⊘ Canceled

Steps

1. In the left navigation pane, click **Monitor**.

2. In the **Monitor** page, click **Jobs**.

3. Optional: In the **Jobs** page, perform the following steps:

    a. Click ▼ to filter the list so that only backup operations are listed.

    b. Specify the start and end dates.

    c. From the **Type** drop-down list, select **Backup**.

    d. From the **Status** drop-down, select the backup status.

    e. Click **Apply** to view the operations completed successfully.

4. Select a backup job, and then click **Details** to view the job details.

> **Note:** Though the backup job status displays ✓ , when you click on job details you might see that some of the child tasks of the backup operation are still in progress.

5. Optional: In the **Job Details** page, click **View logs**.

The **View logs** button displays the detailed logs for the selected operation.

Monitoring operations in the Activity pane

The Activity pane displays the five most recent operations performed. The Activity pane also displays when the operation was initiated and the status of the operation.

About this task

The Activity pane displays information regarding backup, restore, clone, and scheduled backup operations.

Steps

1. In the left navigation pane, click **Resources**, and then select the appropriate plug-in from the list.

2. Click ⋀ on the **Activity** pane to view the five most recent operations.

When you click one of the operations, the operation details are listed in the Job Details page.

Canceling the backup operations

You can cancel backup operations that are queued.

Before you begin

- You must be logged in as the SnapCenter Admin or job owner to cancel operations.

About this task

- You can cancel a backup operation from either the Monitor page or the Activity pane.

- You can use the SnapCenter GUI, PowerShell cmdlets, or CLI commands to cancel the backup operations.

- The **Cancel Job** button is disabled for operations that cannot be canceled.

- If you selected **All members of this role can see and operate on other members objects** in Users\Groups page while creating a role, you can cancel the queued backup operations of other members while using that role.

Step

1. Perform one of the following actions:

From the…	Action
Monitor page	**a.** In the left navigation pane, click **Monitor** > **Jobs**. **b.** Select the operation, and click **Cancel Job**.
Activity pane	**a.** After initiating the backup operation, click ⌃ on the Activity pane to view the five most recent operations. **b.** Select the operation. **c.** In the Job Details page, click **Cancel Job**.

Result

The operation is canceled, and the resource is reverted to the previous state.

Related information

SnapCenter Software 4.2 Windows Cmdlet Reference Guide

Restoring Windows file system backups

You can use SnapCenter to restore file system backups. File system restoration is a multiphase process that copies all the data from a specified backup to the original location of the file system.

Before you begin

• You must have backed up the file system.

• If a scheduled operation, such as a backup operation, is currently in progress for a file system, then that operation must be cancelled before you can start a restore operation.

About this task

• You can only restore a file system backup to the original location, not to an alternate path.
  You cannot restore a single file from a backup because the restored file system overwrites any data on the original location of the file system. To restore a single file from a file system backup, you must clone the backup and access the file in the clone.

• You cannot restore a system or boot volume.

• SnapCenter can restore file systems in a Windows cluster without taking the cluster group offline.

Most of the fields on the Restore wizard pages are self-explanatory. The following information describes fields for which you might need guidance.

Steps

1. In the left navigation pane, click **Resources**, and then select the appropriate plug-in from the list.

2. To filter the list of resources, select the **File System** and **Resource Group** options.

3. Select a resource group from the list, and then click **Restore**.

4. In the **Backups** page, select whether you want to restore from primary or secondary storage systems, and then select a backup to restore.

5. Select your options in the **Restore** wizard.

6. Optional: You can enter the path and the arguments of the prescript or postscript that you want SnapCenter to run before or after the restore operation, respectively.

   For example, you can run a script to update SNMP traps, automate alerts, send logs, and so on.

7. In the **Notification** page, select one of the following options:

For this field…	Do this…
Log SnapCenter server events to storage system syslog	Select this option to log SnapCenter Server events to the syslog of the storage system.
Send AutoSupport notification for failed operations to storage system	Select this option to send information about any failed operations to NetApp using AutoSupport.
Email preference	Select **Always**, **On Failure**, or **On failure or warning** to send email messages to recipients after restoring backups. Enter the SMTP server, default email subject line, and To and From email addresses.

8. Review the summary, and then click **Finish**.

9. Monitor the operation progress by clicking **Monitor > Jobs**.

After you finish

> **Attention:** If the restored file system contains a database, then you must also restore the database. If you do not restore the database, then your database might be in an invalid state. For information on restoring databases, see the Data Protection Guide for that database.

> *Protecting Microsoft SQL Server databases*

> *Protecting Microsoft Exchange Server databases*

Related tasks

> *Monitoring restore operations* on page 21
> *Restoring and recovering resources using PowerShell cmdlets* on page 30

Related information

> *SnapCenter Software 4.2 Windows Cmdlet Reference Guide*

Monitoring restore operations

You can monitor the progress of different SnapCenter restore operations by using the Jobs page. You might want to check the progress of an operation to determine when it is complete or if there is an issue.

About this task

Post-restore states describe the conditions of the resource after a restore operation and any further restore actions that you can take.

The following icons appear on the Jobs page, and indicate the state of the operation:

- In progress

- Completed successfully

- Failed

- Completed with warnings or could not start due to warnings

- Queued

- Canceled

Steps

1. In the left navigation pane, click **Monitor**.

2. In the **Monitor** page, click **Jobs**.

3. Optional: In the **Jobs** page, perform the following steps:

   a. Click to filter the list so that only restore operations are listed.

      b. Optional: Specify the start and end dates.

      c. From the **Type** drop-down list, select **Restore**.

      d. From the **Status** drop-down list, select the restore status.

      e. Click **Apply** to view the operations that are completed successfully.

4. Select the restore job, and then click **Details** to view the job details.

5. Optional: In the **Job Details** page, click **View logs**.

The **View logs** button displays the detailed logs for the selected operation.

Canceling restore operations

You can cancel restore jobs that are queued.

Before you begin

- You must be logged in as the SnapCenter Admin or job owner to cancel restore operations.

About this task

- You can cancel a restore operation from either the Monitor page or the Activity pane.

- You cannot cancel a running restore operation.

- You can use the SnapCenter GUI, PowerShell cmdlets, or CLI commands to cancel the restore operations.

- The **Cancel Job** button is disabled for restore operations that cannot be canceled.

- If you selected **All members of this role can see and operate on other members objects** in Users\Groups page while creating a role, you can cancel the queued backup operations of other members while using that role.

Step

1. Perform one of the following actions:

From the…	Action
Monitor page	**a.** In the left navigation pane, click **Monitor > Jobs**. **b.** Select the job and click **Cancel Job**.
Activity pane	**a.** After initiating the restore operation, click ◢◣ on the Activity pane to view the five most recent operations. **b.** Select the operation. **c.** In the Job Details page, click **Cancel Job**.

Related information

SnapCenter Software 4.2 Windows Cmdlet Reference Guide

Cloning from a Windows file system backup

You can use SnapCenter to clone a Windows file system backup. If you want a copy of a single file that was mistakenly deleted or changed, then you can clone a backup and access that file in the clone.

Before you begin

- You must have prepared for data protection by completing tasks such as adding hosts, identifying resources, and creating storage virtual machine (SVM) connections.

- You must have a backup of the file system.

About this task

- You cannot clone a resource group. You can only clone individual file system backups.

- If a backup resides on a virtual machine with a VMDK disk, SnapCenter cannot clone the backup to a physical server.

- If you clone a Windows cluster (for example, a shared LUN or a cluster shared volume (CSV) LUN), the clone is stored as a dedicated LUN on the host that you specify.

- For a cloning operation, the root directory of the volume mount point cannot be a shared directory.

- You cannot create a clone on a node that is not the home node for the aggregate.

- You cannot schedule recurring clone (clone lifecycle) operations for Windows file systems; you can only clone a backup on demand.

- If you move a LUN that contains a clone to a new volume, SnapCenter can no longer support the clone. For example, you cannot use SnapCenter to delete that clone.

Most of the fields on the Clone wizard pages are self-explanatory. The following information describes some of the fields for which you might require guidance.

Steps

1. In the left navigation pane, click **Resources**, and then select the appropriate plug-in from the list.

2. In the **Resources** page, select **File Systems** from the list.

3. Select the host.

   The topology view is automatically displayed if the resource is protected.

4. From the resources list, select the backup that you want to clone, and then click the clone icon.

5. In the **Options** page, do the following:

For this field…	Do this…
Clone server	Choose the host on which the clone should be created.

For this field…	Do this…
"Auto assign mount point" or "Auto assign volume mount point under path"	Choose whether to automatically assign a mount point or a volume mount point under a path. **Auto assign volume mount point under path**: The mount point under a path enables you to provide a specific directory in which the mount points will be created. Before you choose this option, you must verify that the directory is empty. If there is a backup in the directory, the backup will be in an invalid state after the mount operation.
Archive location	Choose an archive location if you are cloning a secondary backup.

6. In the **Script** page, specify any prescripts or postscripts you want to execute.

7. Review the summary, and then click **Finish**.

8. Monitor the operation progress by clicking **Monitor > Jobs**.

Related tasks

Monitoring clone operations in SnapCenter on page 24
Cloning backups using PowerShell cmdlets on page 32

Related information

SnapCenter Software 4.2 Windows Cmdlet Reference Guide

Monitoring clone operations in SnapCenter

You can monitor the progress of SnapCenter clone operations by using the Jobs page. You might want to check the progress of an operation to determine when it is complete or if there is an issue.

About this task

The following icons appear on the Jobs page, and indicate the state of the operation:

- In progress
- Completed successfully
- Failed
- Completed with warnings or could not start due to warnings
- Queued
- Canceled

Steps

1. In the left navigation pane, click **Monitor**.

2. In the **Monitor** page, click **Jobs**.

3. In the **Jobs** page, perform the following steps:

    a. Click ▼ to filter the list so that only clone operations are listed.

    b. Specify the start and end dates.

    c. From the **Type** drop-down list, select **Clone**.

    d. From the **Status** drop-down list, select the clone status.

    e. Click **Apply** to view the operations that are completed successfully.

4. Select the clone job, and then click **Details** to view the job details.

5. In the **Job Details** page, click **View logs**.

Canceling clone operations

You can cancel clone operations that are queued.

Before you begin

- You must be logged in as the SnapCenter Admin or job owner to cancel operations.

About this task

- You can cancel a clone operation from either the Monitor page or the Activity pane.

- You cannot cancel a running clone operation.

- You can use the SnapCenter GUI, PowerShell cmdlets, or CLI commands to cancel the clone operations.

- If you selected **All members of this role can see and operate on other members objects** in Users\Groups page while creating a role, you can cancel the queued backup operations of other members while using that role.

Step

1. Perform one of the following actions:

From the…	Action
Monitor page	**a.** In the left navigation pane, click **Monitor > Jobs**. **b.** Select the operation, and click **Cancel Job**.
Activity pane	**a.** After initiating the clone operation, click ⌃ on the Activity pane to view the five most recent operations. **b.** Select the operation. **c.** In the Job Details page, click **Cancel Job**.

Related information

SnapCenter Software 4.2 Windows Cmdlet Reference Guide

Splitting a clone

You can use SnapCenter to split a cloned resource from the parent resource. The clone that is split becomes independent of the parent resource.

About this task

- You cannot perform the clone split operation on an intermediate clone.

  For example, after you create clone1 from a database backup, you can create a backup of clone1, and then clone this backup (clone2). After you create clone2, clone1 is an intermediate clone, and you cannot perform the clone split operation on clone1. However, you can perform the clone split operation on clone2.

  After splitting clone2, you can perform the clone split operation on clone1 because clone1 is no longer the intermediate clone.

- When you split a clone, the backup copies and clone jobs of the clone are deleted.

- For information about clone split operation limitations, see the *Logical Storage Management Guide*.

  ONTAP 9 Logical Storage Management Guide

Steps

1. In the left navigation pane, click **Resources**, and then select the appropriate plug-in from the list.

2. In the **Resources** page, select the appropriate option from the **View** list:

Option	Description
For database applications	Select **Database** from the View list.
For file systems	Select **Path** from the View list.

3. Select the cloned resource (for example, the database or LUN), and then click ∎.

4. Review the estimated size of the clone that is to be split and the required space available on the aggregate, and then click **Start**.

5. Monitor the operation progress by clicking **Monitor > Jobs**.

After you finish

If you want a longer poll time or shorter poll time to check whether the clone is split or not, you can change the value of CloneSplitStatusCheckPollTime parameter in SMCoreServiceHost.exe.config file to set the time interval for SMCore to poll for the status of the clone split operation. The value is in milliseconds and the default value is 5 minutes.

For example:

```
<add key="CloneSplitStatusCheckPollTime" value="300000" />
```

Backing up, restoring, cloning, and removing backups using PowerShell cmdlets

The SnapCenter Plug-in for Microsoft SQL Server and the SnapCenter Plug-in for Microsoft Windows include PowerShell cmdlets for scripting of backup, restore, and clone operations.

The following are common tasks you might perform using PowerShell cmdlets:

- Preparing the PowerShell environment

- Creating a storage system connection and a credential

- Backing up SQL Server databases or Windows file systems

- Restoring and recovering SQL Server databases

- Restoring Windows file systems

- Cloning backups for SQL Server databases or Windows file systems

- Removing backups

- Cleaning up secondary backup counts

The information regarding the parameters that can be used with the cmdlet and their descriptions can be obtained by running Get-Help *command_name*. Alternatively, you can also refer to the *Cmdlet Reference Guide*.

SnapCenter Software 4.2 Windows Cmdlet Reference Guide

Creating a storage system connection and a credential using PowerShell cmdlets

You must create a storage virtual machine (SVM) connection and a credential before using PowerShell cmdlets to perform data protection operations.

Before you begin

- You should have prepared the PowerShell environment to execute the PowerShell cmdlets.

- You should have the required permissions in the Infrastructure Admin role to create storage connections.

- You should ensure that the plug-in installations are not in progress.
  Host plug-in installations must not be in progress while adding a storage system connection because the host cache might not be updated and databases status might be displayed in the SnapCenter GUI as "Not available for backup" or "Not on NetApp storage".

- Storage system names should be unique.
  SnapCenter does not support multiple storage systems with the same name on different clusters. Each storage system that is supported by SnapCenter should have a unique name and a unique data LIF IP address.

About this task

The information regarding the parameters that can be used with the cmdlet and their descriptions can be obtained by running Get-Help *command_name*. Alternatively, you can also refer to the *Cmdlet Reference Guide*.

SnapCenter Software 4.2 Windows Cmdlet Reference Guide

Steps

1. Initiate a PowerShell connection session by using the `Open-SmConnection` cmdlet.

   Example

   This example opens a PowerShell session:

   ```
   PS C:\> Open-SmStorageConnection
   ```

2. Create a new connection to the storage system by using the `Add-SmStorageConnection` cmdlet.

   Example

   This example creates a new storage system connection:

   ```
   PS C:\> Add-SmStorageConnection -Storage test_vs1 -Protocol Https
   -Timeout 60
   ```

3. Create a new credential by using the `Add-SmCredential` cmdlet.

   Example

   This example creates a new credential named FinanceAdmin with Windows credentials:

   ```
   PS C:> Add-SmCredential -Name FinanceAdmin -AuthMode Windows
   -Credential sddev\administrator
   ```

Backing up resources using PowerShell cmdlets

Backing up a SQL Server database or Windows file system includes establishing a connection with the SnapCenter Server, discovering the SQL Server database instances or Windows file systems, adding a policy, creating a backup resource group, backing up, and verifying the backup.

Before you begin

- You must have prepared the PowerShell environment to execute the PowerShell cmdlets.

- You must have added the storage system connection and created a credential.

- You must have added hosts and discovered resources.

About this task

The information regarding the parameters that can be used with the cmdlet and their descriptions can be obtained by running `Get-Help command_name`. Alternatively, you can also refer to the *Cmdlet Reference Guide*.

SnapCenter Software 4.2 Windows Cmdlet Reference Guide

Steps

1. Initiate a connection session with the SnapCenter Server for a specified user by using the `Open-SmConnection` cmdlet.

Example

```
Open-smconnection  -SMSbaseurl  https:\\snapctr.demo.netapp.com:8146/
```

The username and password prompt is displayed.

2. Create a backup policy by using the `Add-SmPolicy` cmdlet.

Example

This example creates a new backup policy with a SQL backup type of FullBackup:

```
PS C:\> Add-SmPolicy -PolicyName TESTPolicy
-PluginPolicyType SCSQL -PolicyType Backup
-SqlBackupType FullBackup -Verbose
```

Example

This example creates a new backup policy with a Windows file system backup type of CrashConsistent:

```
PS C:\> Add-SmPolicy -PolicyName FileSystemBackupPolicy
-PluginPolicyType SCW -PolicyType Backup
-ScwBackupType CrashConsistent -Verbose
```

3. Discover host resources by using the `Get-SmResources` cmdlet.

Example

This example discovers the resources for the Microsoft SQL plug-in on the specified host:

```
C:\PS>PS C:\> Get-SmResources -HostName vise-f6.sddev.mycompany.com
-PluginCode SCSQL
```

Example

This example discovers the resources for Windows file systems on the specified host:

```
C:\PS>PS C:\> Get-SmResources -HostName vise2-f6.sddev.mycompany.com
-PluginCode SCW
```

4. Add a new resource group to SnapCenter by using the `Add-SmResourceGroup` cmdlet.

Example

This example creates a new SQL database backup resource group with the specified policy and resources:

```
PS C:\> Add-SmResourceGroup -ResourceGroupName AccountingResource
-Resources @{"Host"="visef6.org.com";
"Type"="SQL Database";"Names"="vise-f6\PayrollDatabase"}
-Policies "BackupPolicy"
```

Example

This example creates a new Windows file system backup resource group with the specified policy and resources:

```
PS C:\> Add-SmResourceGroup -ResourceGroupName EngineeringResource
-PluginCode SCW -Resources @{"Host"="WIN-VOK20IKID5I";
"Type"="Windows Filesystem";"Names"="E:\"}
-Policies "EngineeringBackupPolicy"
```

5. Initiate a new Snapshot copy job by using the `New-SmBackup` cmdlet.

Example

```
PS C:> New-SmBackup -ResourceGroupName PayrollDataset -Policy
FinancePolicy
```

6. View the status of the backup job by using the `Get-SmBackupReport` cmdlet.

Example

This example displays a job summary report of all jobs that were run on the specified date:

```
PS C:\> Get-SmJobSummaryReport -Date ?1/27/2016?
```

Restoring and recovering resources using PowerShell cmdlets

Restoring and recovering a SQL Server database or Windows file system includes initiating a connection session with the SnapCenter Server, listing the backups and retrieving backup information, and restoring a backup.

Before you begin

You must have prepared the PowerShell environment to execute the PowerShell cmdlets.

About this task

The information regarding the parameters that can be used with the cmdlet and their descriptions can be obtained by running `Get-Help` *command_name*. Alternatively, you can also refer to the *Cmdlet Reference Guide*.

SnapCenter Software 4.2 Windows Cmdlet Reference Guide

Steps

1. Initiate a connection session with the SnapCenter Server for a specified user by using the `Open-SmConnection` cmdlet.

Example

```
Open-smconnection  -SMSbaseurl  https:\\snapctr.demo.netapp.com:8146/
```

2. Retrieve the information about the one or more backups that you want to restore by using the `Get-SmBackup` and `Get-SmBackupReport` cmdlets.

Example

This example displays information about all available backups:

```
PS C:\> Get-SmBackup

BackupId    BackupName                            BackupTime    BackupType
--------    ----------                            ----------    ----------
1           Payroll Dataset_vise-f6_08...         8/4/2015      Full Backup
                                                  11:02:32 AM

2           Payroll Dataset_vise-f6_08...         8/4/2015
                                                  11:23:17 AM
```

Example

This example displays detailed information about the backup
Secondary_SCSPR0019366001_01-15-2015_06.49.08:

```
PS C:\> Get-SmBackupReport
-BackupName Secondary_SCSPR0019366001_01-15-2015_06.49.08

BackedUpObjects : {TestDB1, TestDB2, TestDB3, TestDB4...}
FailedObjects : {}
BackupType : Full Backup
IsScheduled : False
SmBackupId : 52
SmJobId : 585
StartDateTime : 1/15/2015 6:49:07 AM
EndDateTime : 1/15/2015 6:49:21 AM
Duration : 00:00:13.8370000
CreatedDateTime : 1/15/2015 6:49:18 AM
Status : Completed
ProtectionGroupName : Secondary
SmProtectionGroupId : 5
PolicyName : Vault
SmPolicyId : 18
BackupName : Secondary_SCSPR0019366001_01-15-2015_06.49.08
VerificationStatus : NotVerified
```

3. Restore data from the backup by using the `Restore-SmBackup` cmdlet.

Example

```
C:\PS>PS C:\> Restore-SmBackup -PluginCode SCSQL
-AppObjectId 'vise-f6\PayrollDatabase'
-BackupName 'NetApp_PayrollDataset_Backup Policy_
           vise-f6_NetApp_08-07-2015_08.48.59.6962'
-RestoreWhenOnline

 Name                : Restore 'vise-f6\PayrollDatabase'
 Id                  : 199
 StartTime           : 8/7/2015 9:21:36 AM
 EndTime             :
 IsCancellable       : False
 IsRestartable       : False
 IsCompleted         : False
 IsVisible           : False
 IsScheduled         : False
 PercentageCompleted : 0
 Description         :
 Status              : Queued
 Owner               :
 Error               :
 Priority            : None
 Tasks               : {}
 ParentJobID         : 0
 EventId             : 0
```

Example

```
Restore-SmBackup -PluginCode SCSQL -AppObjectId 'scspr0270378001\abc'
-BackupName 'sc
spr0270378001_abc_scspr0270378001_07-25-2017_04.51.10.5795' -
AlternatePath @{Source='D:\data\abc.mdf';Destinatio
n='D:\data\bharathaewf123.mdf'},@{Source='D:\log
\bharath_log.ldf';Destination='D:\log\bharathaef_log123.ldf'} -
SQLInstan
ceName 'scspr0273089004' -DatabaseName 'abc123adwqa1231' -
ExistingFiles
```

Cloning backups using PowerShell cmdlets

The clone workflow includes planning, performing the clone operation, and monitoring the operation.

Before you begin

You must have prepared the PowerShell environment to execute the PowerShell cmdlets.

About this task

The information regarding the parameters that can be used with the cmdlet and their descriptions can be obtained by running Get-Help *command_name*. Alternatively, you can also refer to the *Cmdlet Reference Guide*.

SnapCenter Software 4.2 Windows Cmdlet Reference Guide

Steps

1. Initiate a connection session with the SnapCenter Server for a specified user by using the Open-SmConnection cmdlet.

Example

```
Open-SmConnection  -SMSbaseurl  https:\\snapctr.demo.netapp.com:8146/
```

2. List the backups that can be cloned by using the Get-SmBackup or Get-SmResourceGroup cmdlet.

Example

This example displays information about all available backups:

```
C:\PS>PS C:\> Get-SmBackup

BackupId   BackupName                      BackupTime   BackupType
--------   ----------                      ----------   ----------
1          Payroll Dataset_vise-f6_08...   8/4/2015     Full Backup
                                           11:02:32 AM

2          Payroll Dataset_vise-f6_08...   8/4/2015
                                           11:23:17 AM
```

Example

This example displays information about a specified resource group, its resources, and associated policies:

```
PS C:\> Get-SmResourceGroup -ListResources -ListPolicies

Description :
CreationTime : 8/4/2015 3:44:05 PM
ModificationTime : 8/4/2015 3:44:05 PM
EnableEmail : False
EmailSMTPServer :
EmailFrom :
EmailTo :
EmailSubject :
EnableSysLog : False
ProtectionGroupType : Backup
EnableAsupOnFailure : False
Policies : {FinancePolicy}
HostResourceMaping : {}
Configuration : SMCoreContracts.SmCloneConfiguration
LastBackupStatus :
VerificationServer :
EmailBody :
EmailNotificationPreference : Never
VerificationServerInfo : SMCoreContracts.SmVerificationServerInfo
SchedulerSQLInstance :
CustomText :
CustomSnapshotFormat :
SearchResources : False
ByPassCredential : False
IsCustomSnapshot :
MaintenanceStatus : Production
PluginProtectionGroupTypes : {SMSQL}
Name : Payrolldataset
Type : Group
Id : 1
Host :
UserName :
Passphrase :
Deleted : False
Auth : SMCoreContracts.SmAuth
IsClone : False
CloneLevel : 0
ApplySnapvaultUpdate : False
ApplyRetention : False
RetentionCount : 0
RetentionDays : 0
ApplySnapMirrorUpdate : False
SnapVaultLabel :
MirrorVaultUpdateRetryCount : 7
AppPolicies : {}
Description : FinancePolicy
PreScriptPath :
PreScriptArguments :
PostScriptPath :
PostScriptArguments :
ScriptTimeOut : 60000
DateModified : 8/4/2015 3:43:30 PM
DateCreated : 8/4/2015 3:43:30 PM
Schedule : SMCoreContracts.SmSchedule
PolicyType : Backup
PluginPolicyType : SMSQL
Name : FinancePolicy
Type :
Id : 1
Host :
UserName :
Passphrase :
Deleted : False
Auth : SMCoreContracts.SmAuth
IsClone : False
CloneLevel : 0
clab-a13-13.sddev.lab.netapp.com
DatabaseGUID :
SQLInstance : clab-a13-13
```

```
DbStatus : AutoClosed
DbAccess : eUndefined
IsSystemDb : False
IsSimpleRecoveryMode : False
IsSelectable : True
SqlDbFileGroups : {}
SqlDbLogFiles : {}
AppFileStorageGroups : {}
LogDirectory :
AgName :
Version :
VolumeGroupIndex : -1
IsSecondary : False
Name : TEST
Type : SQL Database
Id : clab-a13-13\TEST
Host : clab-a13-13.sddev.mycompany.com
UserName :
Passphrase :
Deleted : False
Auth : SMCoreContracts.SmAuth
IsClone : False
```

3. Initiate a clone operation from an existing backup by using the `New-SmClone` cmdlet.

Example

This example creates a clone from a specified backup with all logs:

```
PS C:\> New-SmClone
-BackupName payroll_dataset_vise-f3_08-05-2015_15.28.28.9774
-Resources @{"Host"="vise-f3.sddev.mycompany.com";
"Type"="SQL Database";"Names"="vise-f3\SQLExpress\payroll"}
-CloneToInstance vise-f3\sqlexpress -AutoAssignMountPoint
-Suffix _clonefrombackup
-LogRestoreType All -Policy clonefromprimary_ondemand

PS C:> New-SmBackup -ResourceGroupName PayrollDataset -Policy
FinancePolicy
```

Example

This example creates a clone to a specified Microsoft SQL Server instance:

```
PS C:\> New-SmClone
-BackupName "BackupDS1_NY-VM-SC-SQL_12-08-2015_09.00.24.8367"
-Resources @{"host"="ny-vm-sc-sql";"Type"="SQL Database";
"Names"="ny-vm-sc-sql\AdventureWorks2012_data"}
-AppPluginCode SMSQL -CloneToInstance "ny-vm-sc-sql"
-Suffix _CLPOSH -AutoAssignMountPoint
-AssignMountPointUnderPath "C:\SCMounts"
```

4. View the status of the clone job by using the `Get-SmCloneReport` cmdlet.

Example

This example displays a clone report for the specified job ID:

```
PS C:\> Get-SmCloneReport -JobId 186

SmCloneId : 1
SmJobId : 186
StartDateTime : 8/3/2015 2:43:02 PM
EndDateTime : 8/3/2015 2:44:08 PM
Duration : 00:01:06.6760000
Status : Completed
```

```
ProtectionGroupName : Draper
SmProtectionGroupId : 4
PolicyName : OnDemand_Clone
SmPolicyId : 4
BackupPolicyName : OnDemand_Full_Log
SmBackupPolicyId : 1
CloneHostName : SCSPR0054212005.mycompany.com
CloneHostId : 4
CloneName : Draper__clone__08-03-2015_14.43.53
SourceResources : {Don, Betty, Bobby, Sally}
ClonedResources : {Don_DRAPER, Betty_DRAPER, Bobby_DRAPER,
                   Sally_DRAPER}
```

Removing backups using PowerShell cmdlets

You can use the `Remove-SmBackup` cmdlet to delete backups if you no longer require them for other data protection operations.

Before you begin

You must have prepared the PowerShell environment to execute the PowerShell cmdlets.

About this task

The information regarding the parameters that can be used with the cmdlet and their descriptions can be obtained by running `Get-Help` *command_name*. Alternatively, you can also refer to the *Cmdlet Reference Guide*.

SnapCenter Software 4.2 Windows Cmdlet Reference Guide

Steps

1. Initiate a connection session with the SnapCenter Server for a specified user by using the `Open-SmConnection` cmdlet.

   Example

   ```
   Open-SmConnection  -SMSbaseurl  https:\\snapctr.demo.netapp.com:8146/
   ```

2. Delete one or more backup using the `Remove-SmBackup` cmdlet.

   Example

   This example deletes two backups using their backup IDs:

   ```
   Remove-SmBackup -BackupIds 3,4
   Remove-SmBackup
   Are you sure want to remove the backup(s).
   [Y] Yes  [A] Yes to All  [N] No  [L] No to All  [S] Suspend  [?] Help
   (default is "Y"):
   ```

Related information

SnapCenter Software 4.2 Windows Cmdlet Reference Guide

Cleaning up the secondary backup count using PowerShell cmdlets

You can use the `Remove-SmBackup` cmdlet to clean up the backup count for secondary backups that have no Snapshot copies. You might want use this cmdlet when the total Snapshot copies displayed in the Manage Copies topology do not match the secondary storage Snapshot copy retention setting.

Before you begin

You must have prepared the PowerShell environment to execute the PowerShell cmdlets.

About this task

The information regarding the parameters that can be used with the cmdlet and their descriptions can be obtained by running `Get-Help command_name`. Alternatively, you can also refer to the *Cmdlet Reference Guide*.

SnapCenter Software 4.2 Windows Cmdlet Reference Guide

Steps

1. Initiate a connection session with the SnapCenter Server for a specified user by using the `Open-SmConnection` cmdlet.

   Example

   ```
   Open-SmConnection  -SMSbaseurl  https:\\snapctr.demo.netapp.com:8146/
   ```

2. Clean up secondary backups count using the `-CleanupSecondaryBackups` parameter.

   Example

   This example cleans up the backup count for secondary backups with no Snapshot copies:

   ```
   Remove-SmBackup -CleanupSecondaryBackups
   Remove-SmBackup
   Are you sure want to remove the backup(s).
   [Y] Yes  [A] Yes to All  [N] No  [L] No to All  [S] Suspend  [?] Help
   (default is "Y"):
   ```

Related information

SnapCenter Software 4.2 Windows Cmdlet Reference Guide

Troubleshooting data protection operations

If you encounter unexpected behavior while performing data protection operations, you can use the log files to identify the cause and resolve the problem.

You can download the log files from the SnapCenter user interface by clicking **Monitor > Logs > Download**.

Back up operation on some hosts might trigger late

Description

If a resource group has multiple databases from different hosts, the backup operation on some hosts might trigger late because of network issues.

Error message

Scheduled job is not triggered on host(s) <HOST_NAMES>

Corrective action

You should configure the key MaxRetryForUninitializedHosts value in web.config by using the Set SmConfigSettings PS cmdlet cmdlet. In the following example, the default value of the retry count is 10:

```
Set-SmConfigSettings -Server -configSettings
@{"MaxRetryForUninitializedHosts"=10}
```

SnapCenter Plug-in Package for Microsoft Windows or SnapCenter Plug-in for Microsoft SQL Server upgrade might fail on hosts with SQL databases on VMDK

Description

When upgrading SnapCenter Plug-in for Microsoft Windows or SnapCenter Plug-in for Microsoft SQL Server on hosts with SQL databases on VMDK, the upgrade might fail.

Error message

The installation log displays the error Engine: error 80070002 while running parcel operations .

Workaround

Delete the following directories on the plug-in host:

- C:\Windows\SnapCenter plugin

- All files and directories in C:\Users\Administrator.*domain_name*\AppData\Local \Downloaded Installations

If the upgrade does not succeed after you delete the specified files and directories, you might need to reboot the SQL server host, and then delete the files and directories.

Storage layout could not be determined

Description

If the OTAP CIFS Server name is not resolvable, then an APPLY PSL job fails.

Error message
```
Storage layout could not be determined.
```

Corrective action

Make sure the CIFS Server name is resolvable.

HTTP error 503. The service is unavailable.

Description

Launching SnapCenter from a browser or opening a connection from the CLI might fail after installation if Windows Process Activation Service (WAS) is not enabled.

Corrective action

Verify in Windows Server Manager that Windows Process Activation Service is enabled.

Unable to display SnapCenter web login page on local host

Description

When using Internet Explorer with Protected Mode enabled, the SnapCenter login page does not display when logging in to the local SnapCenter host as a user from another trusted domain.

Corrective action

Disable Protected Mode in Internet Explorer.

SnapCenter plug-in loader fails with an error

Description

SnapCenter plug-in loader fails with an error.

Error message
```
Error retrieving current directory.
```

Corrective action

- You must ensure that you have not deleted any directory where the plug-in is operating on.

- You must increase the memory space allotted to the Java Virtual Machine.

SnapCenter plug-in loader does not start automatically when the host is restarted

Description

When the host is restarted, the SnapCenter plug-in loader (SPL) does not start automatically if there is no symbolic link in `/user/bin/Java`, or if Java is mounted from an external entity.

Error message

```
ERROR: JAVA_HOME is set to an invalid directory.
```

```
Failed to start SnapCenter Plugin Loader.
```

Corrective action

If the host is running on...	Then...
`init.d`	1. Create the `spl` configuration file at `/etc/default/`. 2. Add `export JAVA_HOME=`*`path_where_java_is_mounted`* to the `spl` configuration file. 3. Add `[-f /etc/default/spl ] && . /etc/default/spl` to the beginning of the SPL init script located at `/etc/init.d/`.

`system.d`	1. Create the `spl.conf` configuration file at `/etc/systemd/system/spl.service.d/`.
	
	2. Add the following lines to the `spl.conf` configuration file:
	
	  • `Environment=JAVA_HOME=`*`path_where_java_is_mounted`*
	
	  • `RestartSec=30`
	
	  • `StartLimitInterval=200`
	
	  • `StartLimitBurst=5`
	
	3. After updating `spl.conf`, reload `systemctl` by running the `systemctl daemon-reload` command.

Unable to access cluster IP address from outside network

Description

There is no response when you try to access the cluster IP address from outside the network.

Corrective action

Verify that you can use `ping` to access the dedicated IP addresses of the cluster host from a computer outside the router. If this test fails and you are using multiple network adapters, the issue is not related to Network Load Balancing (NLB). If you are using a single network adapter for the dedicated and cluster IP addresses, consider the following scenarios:

Scenario	Solution
If you are using multicast support, you might find that your router has difficulty resolving the primary IP address into a multicast media access control (MAC) address by using the Address Resolution Protocol (ARP)	Verify that you can use `ping` to access the cluster from a client on the cluster's subnet and the cluster host's dedicated IP address from a computer outside the router. If these tests work properly, the router is probably at fault. You should be able to add a static ARP entry to the router to circumvent the issue.
When using NLB in multicast or unicast mode, routers need to accept proxy ARP responses (IP-to-network address mappings that are received with a different network source address in the ethernet frame).	You must ensure that that your router has proxy ARP support turned on. You can also set a static ARP entry to keep proxy ARP support disabled in the router.
Internet control message protocol (ICMP) to the cluster is blocked by a router or firewall.	Allow ICMP traffic through the router or firewall. However, allowing ICMP traffic through router or firewall might expose your system to additional security risk.

Backup fails with error: Storage system(s) may need to be added, also ensure that the associated host is in a connected state

Description

A backup failed because the preferred IP address that was configured for the SVM went down. When the preferred IP comes up again, the SnapCenter cache is not automatically refreshed. Therefore, SnapCenter could not find the Preferred IP when attempting to perform the backup.

Corrective action

Refresh the SnapCenter cache for the SVM:

1. In the left navigation pane of the SnapCenter GUI, click **Storage Systems**.

2. In the Storage Systems page, select the storage system used by the backup, and then click **Modify**.

3. Make sure that the **Preferred IP** check box is selected and that the IP is correct.

4. Reenter the storage system password, and then click **OK**.
   This action refreshes the SnapCenter cache and updates the storage system configuration.

Unable to find Snapshot copy after successfully creating the backup

Description

Backup operations with an update to SnapVault or SnapMirror might fail.

Depending on the rate of change of data between Snapshot copies, the time taken to update the Snapshot copy to secondary varies. If the delta between Snapshot copies is very high, it is recommended to change `SnapshotCheckRetry` and `SnapshotCheckTimeout` values.

Error message

```
Snapshot copy could not be found on the destination storage system.
```

Corrective action

You must include the following parameters and specify the value in the `appsetting` section of the `SMCoreServiceHost.exe.Config` file located under `SmCore` in the SnapCenter Server.

- `<add key="SnapshotCheckRetry" value=`*`retry_value`*`/>`
  The retry_value assigned to `SnapshotCheckRetry` defines the maximum number of retries that are performed to discover the Snapshot copies on the secondary location.

- `<add key="SnapshotCheckTimeout" value=`*`timeout_value`*`/>`
  The *`timeout_value`* (milliseconds) assigned to `SnapshotCheckTimeout` defines the wait or sleep period for every retry.

Backup operation fails if Snapshot copies on the secondary storage reaches maximum limit

Description

When the number of Snapshot copies on the secondary storage (mirror-vault) reaches the maximum limit, the activity to register backup and apply retention in the backup operation fails.

Error message

```
This Snapshot copy is currently used as a reference Snapshot copy by one or
more SnapMirror relationships. Deleting the Snapshot copy can cause future
SnapMirror operations to fail.
```

Corrective action

You should configure SnapMirror retention policy for the secondary storage to avoid reaching the maximum limit of Snapshot copies on the secondary storage.

Scheduled backups fail due to task limit

Description

When SnapCenter is running scheduled jobs, the Windows scheduler returns an error and some scheduled data protection operations fail. This error occurs when the number of tasks reaches the maximum configured for the machine.

Error message

```
User Action: Reduce the number of tasks running in the specified user
context.
```

Corrective action

1. See the Microsoft support document *Error 0x80041323 when running high number of Scheduled tasks* https://support.microsoft.com/en-in/kb/2696472.
   This document contains instructions on how to change the values configured for the registry keys.

2. Set the values in the following registry keys to 1000.

   TasksInMemoryQueue
   TasksPerHighestPrivEngine
   TasksPerLeastPrivEngine

3. Reboot the machine.

Restore operation times out

Description

During a restore operation that accesses VMs, the vCenter Server timed out while waiting for a response from the SnapCenter server.

This error can occur when VMotion or the actual restore operation exceeds the timeout set for responses from the SnapCenter server.

Error message

```
The operation has timed out
```

Corrective action

You can increase the SnapCenter server timeout value by including the following REST API in the appsetting section of the `SMCoreServiceHost.exe.Config` file located under SmCore in the SnapCenter Server:

<add key="RESTTimeout" value="*timeout-value*"/>

The default timeout value is 10800000 (in milliseconds, which is 3 hours). You can increase that value, in milliseconds, as needed.

Clone operation will fail due to inaccessible virtual device

Description

One of the possible reasons a clone operation can fail is because a virtual device that is listed in vCenter is inaccessible because of a permanent device loss.

For example, if the LUN ID of a newly created LUN for a clone operation matches a LUN ID that is being used by an inaccessible LUN in vCenter, the clone operation fails.

Error message

```
Failed to clone resources, error is Failed to Mount/Attach Disk
```

Corrective action

1. Using the vCenter interface, remove the inaccessible LUN.
   Refer to the VMware documentation for information.

2. Using the SnapCenter interface, run the clone operation again.

Clone split estimation fails when the aggregate does not have space

Description

If the aggregate has no space, clone split estimation fails.

Corrective action

Increase the space on the aggregate.

Clone split start operation fails

Description

The clone split start operation fails when one of the following conditions are met:

- The volume or aggregate is offline.

- A clone split operation, backup operation, or restore operation is in progress on the clone resource.

- A clone split operation is in progress on an intermediate clone.

Corrective action

- If the volume or aggregate is offline, check the status of the volume or aggregate on the storage system and bring it back online.

- If a clone split operation, backup operation, or restore operation is in progress on the clone resource, restart the clone split operation after the clone split operation, backup operation, or restore operation is complete.

- If a clone split operation is in progress on an intermediate clone, split the child clones, and then restart the clone split start operation on this clone.

Clone split operation stops responding

Description

The clone split operation stops responding if the SMCore service restarts.

Corrective action

Use the `Stop-SmJob` cmdlet to stop the clone split operation, and then perform the clone split operation again.

Databases on which the clone split operation was performed are listed as clones

Description

During the clone split operation, if the SMCore service restarts, the status of the operation will not be sent to the server. Therefore, the databases on which the clone split operation was performed are listed as clones in the Resources page.

Corrective action

Run the split clone cmdlet again to clean the clone metadata in SnapCenter repository.

Managing resource groups

You can create, modify, and delete resource groups. You can also perform backup and verification operations on resource groups.

About this task

You can perform the following tasks related to resource groups:

- Create a resource group.

- Modify a resource group by selecting the resource group and clicking **Modify Resource Group** to edit the information you provided while creating the resource group.

    Note: You can change the schedule while modifying the resource group. However, to change the schedule type you must modify the policy.

    Note: If you remove resources from a resource group, the backup retention settings defined in the policies currently attached to the resource group will continue to be applied to the removed resources.

- Create a backup of a resource group.

- Create a clone of a backup.
  You can clone from the existing backups of SQL, Oracle, Windows file systems, custom applications, and SAP HANA database resources or resource groups.

- Create a clone of a resource group.
  This operation is supported only for SQL resource groups (which contains only databases). You can configure a schedule for cloning a resource group (clone lifecycle).

- Prevent scheduled operations on resource groups from starting.

- Delete a resource group.

Related tasks

Stopping and resuming operations on resource groups

You can temporarily disable scheduled operations from starting on a resource group. Later when you want, you can enable those operations.

Steps

1. In the left navigation pane, click **Resources**, and then select the appropriate plug-in from the list.

2. In the **Resources** page, select **Resource Group** from the **View** list.

3. Select the resource group and click **Maintenance**.

4. Click **OK**.

After you finish

If you want to resume operations on the resource group that you had put on maintenance mode, select the resource group and click **Production**.

Deleting resource groups

You can delete a resource group if you no longer need to protect the resources in the resource group. You must ensure that resource groups are deleted before you remove plug-ins from SnapCenter.

Before you begin

If you are managing SQL or Windows file system resources, you must have manually deleted all clones created for any of the resources in the resource group.

About this task

You can optionally force the deletion of all backups, metadata, policies, and Snapshot copies associated with the resource group.

> **Note:** In a SnapVault relationship, the last Snapshot copy cannot be deleted; therefore, the resource group cannot be deleted. Before deleting a resource group that is part of a SnapVault relationship, you must remove the SnapVault relationship and then delete the last Snapshot copy.

Steps

1. In the left navigation pane, click **Resources**, and then select the appropriate plug-in from the list.

2. In the **Resources** page, select **Resource Group** from the **View** list.

3. Select the resource group, and then click **Delete**.

4. Optional: Select the **Delete backups and detach policies associated with this Resource Group** check box to remove all backups, metadata, policies, and Snapshot copies associated with the resource group.

5. Click **OK**.

Managing policies

You can create, copy, modify, view, and delete backup policies.

About this task

You can perform the following tasks related to policies:

- Create a policy.

- Modify a policy.

    Note: You can change the schedule type for a policy only after you detach the policy. To change the schedule you must modify the resource group.

- Copy a policy by accepting the default name or typing a new name.

- Detach a policy from a resource group.

- Delete a policy.

Related tasks

Detaching policies

You can detach policies from a resource or resource group any time that you no longer want those policies to govern data protection for the resources. You must detach a policy before you can delete it or before you modify the schedule type.

About this task

> **Attention:** You cannot detach a policy from a resource or resource group if it is the only policy attached.

Steps

1. In the left navigation pane, click **Resources**, and then select the appropriate plug-in from the list.

2. In the **Resources** page, select **Resource Group** from the **View** list.

3. Select the resource group, and then click **Modify Resource Group**.

4. In the **Policies** page of the **Modify Resource Group** wizard, from the drop-down list, clear the check mark next to the policies you want to detach.

    Note: You cannot detach the last remaining policy from an individual resource because every resource must have at least one policy attached. Therefore, if you want to delete or modify the only policy attached to a resource, you must perform the following:

    a. Attach a second placeholder policy.

    b. Detach the original policy from the resource.

5. Make any additional modifications to the resource group in the rest of the wizard, and then click **Finish**.

Modifying policies

You can modify the replication options, Snapshot copy retention settings, error retry count, or scripts information while a policy is attached to a resource or resource group. You can modify the schedule type (frequency) only after you detach a policy.

About this task

Modifying the schedule type in a policy requires additional steps because the SnapCenter Server registers the schedule type only at the time the policy is attached to a resource or resource group.

If you want to...	Then...
Add an additional schedule type	Create a new policy and attach it to the necessary resources or resource groups. For example, if a resource group policy specifies only hourly backups and you want to add daily backups also, you can create a policy with a daily schedule type and add it to the resource group. The resource group would then have two policies: hourly and daily.
Remove or change a schedule type	1. Detach the policy from every resource and resource group that uses that policy. 2. Modify the schedule type. 3. Attach the policy again to all the resources and resource groups. For example, if a policy specifies hourly backups and you want to change that to daily backups, you must detach the policy first. **Note:** You cannot detach the last remaining policy from a individual resource because every resource must have at least one policy attached. Therefore, if you want to modify the schedule type of the only policy attached to a resource, you must perform the following: 1. Attach a second placeholder policy. 2. Detach the original policy from every resource and resource group that uses that policy. 3. Modify the schedule type. 4. Attach the modified policy again to all the resources and resource groups. 5. Detach the placeholder policy.

Steps

1. In the left navigation pane, click **Settings**.

2. In the **Settings** page, click **Policies**.

3. Select the policy, and then click **Modify**.

4. Modify the information, and then click **Finish**.

Deleting policies

If you no longer require policies, you might want to delete them.

Before you begin

You must have detached the policy from resource groups if the policy is associated with any resource group.

Steps

1. In the left navigation pane, click **Settings**.

2. In the **Settings** page, click **Policies**.

3. Select the policy, and then click **Delete**.

4. Click **Yes**.

Managing backups

You can rename and delete backups. You can also delete multiple backups simultaneously.

Related tasks

Renaming backups

You can rename backups if you want to provide a better name to improve searchability.

Steps

1. In the left navigation pane, click **Resources**, and then select the appropriate plug-in from the list.

2. In the **Resources** page either select the resource or resource group from the **View** drop-down list.

3. Select the resource or resource group from the list.

   The resource or resource group topology page is displayed. If the resource or resource group is not configured for data protection, the Protect wizard is displayed instead of the topology page.

4. From the **Manage Copies** view, select **Backups** from the primary storage systems.

   You cannot rename the backups that are on the secondary storage system.

   If you are using SnapCenter Plug-ins Package for Linux and have cataloged the backup using Oracle Recovery Manager (RMAN), you cannot rename those cataloged backups.

5. Select the backup, and then click .

6. In the **Rename backup as** field, enter a new name and click **OK**.

Deleting backups

You can delete backups if you no longer require the backup for other data protection operations.

Before you begin

You must have deleted the associated clones before deleting a backup.

If a backup is associated with a cloned resource, you cannot delete the backup.

Steps

1. In the left navigation pane, click **Resources**, and then select the appropriate plug-in from the list.

2. In the **Resources** page either select the resource or resource group from the **View** drop-down list.

3. Select the resource or resource group from the list.

   The resource or resource group topology page is displayed.

4. From the **Manage Copies** view, select **Backups** from the primary storage systems.

   You cannot delete the backups that are on the secondary storage system.

5. Select the backup, and then click 🗑 .

6. Click **OK**.

> **Note:** If you have some stale database backups in SnapCenter which do not have corresponding backups on the storage system, you must use remove-smbackup command to clean up these stale backup entries. If the stale backups were cataloged, they will be uncataloged from the recovery catalog database.

Managing clones

You can view and delete clones.

Related tasks

Cloning from a Windows file system backup on page 23

Deleting clones

You can delete clones if you find them no longer necessary.

About this task

A clone that has been cloned again cannot be deleted. For example, if the production database *db1* is cloned to *db1_clone1* and subsequently cloned to *db1_clone2*, and you decide that you want to delete *db1_clone1*, you must first delete *db1_clone2*, and then delete *db1_clone1*.

Steps

1. In the left navigation pane, click **Resources**, and then select the appropriate plug-in from the list.

2. In the **Resources** page, either select the resource or resource group from the **View** drop-down list.

3. Select the resource or resource group from the list.

    The resource or the resource group topology page is displayed.

4. From the **Manage Copies** view, select **Clones** either from the primary or secondary (mirrored or replicated) storage systems.

5. Select the clone, and then click 🗑 .

6. Click **OK**.

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