Create snapshots and snapshot objects

SANtricity software

NetApp
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Create a snapshot image in SANtricity System Manager

You can manually create a snapshot image from a base volume or snapshot consistency group. This is also called an *instant snapshot* or *instant image*.

Before you begin

- The base volume must be optimal.
- The drive must be optimal.
- The snapshot group cannot be designated as "reserved."
- The reserved capacity volume must have the same Data Assurance (DA) settings as the associated base volume for the snapshot group.

Steps

1. Do one of the following actions to create a snapshot image:

   ◦ Select **Storage › Volumes**. Select the object (base volume or snapshot consistency group), and then select **Copy Services › Create instant snapshot**.

   ◦ Select **Storage › Snapshots**. Select the **Snapshot Images** tab, and then select **Create › Instant snapshot**.

   The Create Snapshot Image dialog box appears. Select the object (base volume or snapshot consistency group), and then click **Next**. If a previous snapshot image was created for the volume or snapshot consistency group, then the system creates the instant snapshot immediately. Otherwise, if this is the first time a snapshot image is created for the volume or snapshot consistency group, the Confirm Create Snapshot Image dialog box appears.

2. Click **Create** to accept the notification that reserved capacity is needed and to proceed to the Reserve Capacity step.

   The Reserve Capacity dialog box appears.

3. Use the spinner box to adjust the capacity percentage, and then click **Next** to accept the candidate volume highlighted in the table.

   The Edit Settings dialog box appears.

4. Select the settings for the snapshot image as appropriate, and confirm that you want to perform the operation.

Field details

Setting	Description
Snapshot image settings	
Snapshot image limit	Keep the check box selected if you want snapshot images automatically deleted after the specified limit; use the spinner box to change the limit. If you clear this check box, snapshot image creation stops after 32 images.
Reserved capacity settings	
Alert me when…	Use the spinner box to adjust the percentage point at which the system sends an alert notification when the reserved capacity for a snapshot group is nearing full. When the reserved capacity for the snapshot group exceeds the specified threshold, use the advance notice to increase reserved capacity or to delete unnecessary objects before the remaining space runs out.
Policy for full reserved capacity	Choose one of the following policies: **Purge oldest snapshot image** — The system automatically purges the oldest snapshot image in the snapshot group, which releases the snapshot image reserved capacity for reuse within the group. **Reject writes to base volume** — When the reserved capacity reaches its maximum defined percentage, the system rejects any I/O write request to the base volume that triggered the reserved capacity access.

Results

- System Manager displays the new snapshot image in the Snapshot Images table. The table lists the new image by timestamp and associated base volume or snapshot consistency group.
- Snapshot creation might remain in a Pending state because of the following conditions:
  - The base volume that contains this snapshot image is a member of an asynchronous mirror group.
  - The base volume is currently in a synchronization operation. The snapshot image creation completes as soon as the synchronization operation is complete.

Schedule snapshot images in SANtricity System Manager

You create a snapshot schedule to enable recovery in case of a problem with the base volume and to perform scheduled backups. Snapshots of base volumes or snapshot consistency groups can be created on a daily, weekly, or monthly schedule, at any time of day.

Before you begin

The base volume must be Optimal.

About this task

This task describes how to create a snapshot schedule for an existing snapshot consistency group or base volume.

> ⓘ You also can create a snapshot schedule at the same time you create a snapshot image of a base volume or snapshot consistency group.

Steps

1. Do one of the following actions to create a snapshot schedule:

   ◦ Select **Storage › Volumes**.

     Select the object (volume or snapshot consistency group) for this snapshot schedule, and then select **Copy Services › Create snapshot schedule**.

   ◦ Select **Storage › Snapshots**.

     Select the **Schedules** tab, and then click **Create**.

2. Select the object (volume or snapshot consistency group) for this snapshot schedule, and then click **Next**.

   The Create Snapshot Schedule dialog box appears.

3. Do one of the following actions:

   ◦ **Use a previously defined schedule from another snapshot object**.

     Make sure advanced options are displayed. Click **Show more options**. Click **Import Schedule**, select the object with the schedule you want to import, and then click **Import**.

   ◦ **Modify the basic or advanced options**.

     In the upper right of the dialog box, click **Show more options** to display all options, and then refer to the following table.

Field details

Field	Description
Basic settings	
Select days	Select individual days of the week for snapshot images.
Start time	From the drop-down list, select a new start time for the daily snapshots (selections are provided in half-hour increments). The start time defaults to one half-hour ahead of the current time.
Time zone	From the drop-down list, select your array's time zone.
Advanced settings	
Day / month	Choose one of the following options: • **Daily / Weekly** — Select individual days for synchronization snapshots. You also can select the **Select all days** check box in the upper right if you want a daily schedule. • **Monthly / Yearly** — Select individual months for synchronization snapshots. In the **On day(s)** field, enter the days of the month for synchronizations to occur. Valid entries are **1** through **31** and **Last**. You can separate multiple days with a comma or semi-colon. Use a hyphen for inclusive dates. For example: 1,3,4,10-15,Last. You also can select the **Select all months** check box in the upper right if you want a monthly schedule.
Start time	From the drop-down list, select a new start time for the daily snapshots (selections are provided in half-hour increments). The start time defaults to one half-hour ahead of the current time.
Time zone	From the drop-down list, select your array's time zone.
Snapshots per day / Time between snapshots	Select the number of snapshot images to create per day. If you select more than one, also select the time between snapshot images. For multiple snapshot images, be sure that you have adequate reserved capacity.
Create snapshot image right now?	Select this check box to create an instant image in addition to the automatic images you are scheduling.
Start/End date or No end date	Enter the start date for synchronizations to begin. Also enter an end date or select **No end date**.

4. Do one of the following actions:

   ◦ If the object is a snapshot consistency group, click **Create** to accept the settings and create the schedule.

◦ If the object is a volume, click **Next** to allocate reserved capacity for the snapshot images.

The volume candidate table displays only the candidates that support the reserved capacity specified. Reserved capacity is the physical allocated capacity that is used for any copy service operation and storage object. It is not directly readable by the host.

5. Use the spinner box to allocate the reserved capacity for the snapshot images. Do one of the following actions:

◦ **Accept the default settings.**

Use this recommended option to allocate the reserved capacity for the snapshot images with the default settings.

◦ **Allocate your own reserved capacity settings to meet your data storage needs.**

If you change the default reserved capacity setting, click **Refresh Candidates** to refresh the candidate list for the reserved capacity you specified.

Allocate the reserved capacity using the following guidelines:

▪ The default setting for reserved capacity is 40% of the capacity of the base volume. Usually this capacity is sufficient.

▪ The capacity needed varies, depending on the frequency and size of I/O writes to the volumes and the quantity and duration of snapshot image collection.

6. Click **Next**.

The Edit Settings dialog box appears.

7. Edit the settings for the snapshot schedule as needed, and then click **Finish**.

Field details

Setting	Description
Snapshot image limit	
Enable automatic deletion of snapshot images when…	Keep the check box selected if you want snapshot images automatically deleted after the specified limit; use the spinner box to change the limit. If you clear this check box, snapshot image creation stops after 32 images.
Reserved capacity settings	
Alert me when…	Use the spinner box to adjust the percentage point at which the system sends an alert notification when the reserved capacity for a schedule is nearing full. When the reserved capacity for the schedule exceeds the specified threshold, use the advance notice to increase reserved capacity or to delete unnecessary objects before the remaining space runs out.
Policy for full reserved capacity	Choose one of the following policies: • **Purge oldest snapshot image** — The system automatically purges the oldest snapshot image, which releases the snapshot image reserved capacity for reuse within the snapshot group. • **Reject writes to base volume** — When the reserved capacity reaches its maximum defined percentage, the system rejects any I/O write request to the base volume that triggered the reserved capacity access.

Create a snapshot consistency group in SANtricity System Manager

To ensure that you have consistent copies, you can create a set of multiple volumes called a *snapshot consistency group*.

This group allows you to make snapshot images of all the volumes at the same time for consistency. Each volume that belongs to a snapshot consistency group is referred to as a *member volume*. When you add a volume to a snapshot consistency group, the system automatically creates a new snapshot group that corresponds to this member volume.

About this task

The snapshot consistency group creation sequence lets you select member volumes for the group and allocate capacity to the member volumes.

The process to create a snapshot consistency group is a multi-step procedure.

Step 1: Add members to snapshot consistency group

Select members to specify a collection of volumes that comprise the snapshot consistency group. Any actions you perform on the snapshot consistency group extend uniformly to selected member volumes.

Before you begin

The member volumes must be Optimal.

Steps

1. Select **Storage › Snapshots**.

2. Click the **Snapshot Consistency Groups** tab.

3. Select **Create › Snapshot consistency group**.

   The Create Snapshot Consistency Group dialog box appears.

4. Select the volume(s) to be added as member volumes to the snapshot consistency group.

5. Click **Next**, and go to Step 2: Reserve capacity for snapshot consistency group.

Step 2: Reserve capacity for snapshot consistency group

Associate reserved capacity to the snapshot consistency group. System Manager suggests the volumes and capacity based on the properties of the snapshot consistency group. You can accept the recommended reserved capacity configuration or customize the allocated storage.

About this task

On the Reserve Capacity dialog box, the volume candidate table displays only the candidates that support the reserved capacity specified. Reserved capacity is the physical allocated capacity that is used for any copy service operation and storage object. It is not directly readable by the host.

Steps

1. Use the spinner box to allocate the reserved capacity for the snapshot consistency group. Do one of the following actions:

   ◦ **Accept the default settings**.

     Use this recommended option to allocate the reserved capacity for each member volume with the default settings.

   ◦ **Allocate your own reserved capacity settings to meet your data storage needs.**

     Allocate the reserved capacity using the following guidelines.

     ▪ The default setting for reserved capacity is 40% of the capacity of the base volume. Usually this capacity is sufficient.

     ▪ The capacity needed varies, depending on the frequency and size of I/O writes to the volumes and the quantity and duration of snapshot image collection.

2. **Optional:** If you change the default reserved capacity setting, click **Refresh Candidates** to refresh the candidate list for the reserved capacity you specified.

3. Click **Next**, and go to Step 3: Edit settings for snapshot consistency group.

Step 3: Edit settings for snapshot consistency group

Accept or choose automatic deletion settings and reserved capacity alert thresholds for the snapshot consistency group.

About this task

The snapshot consistency group creation sequence lets you select member volumes for the group and allocate capacity to the member volumes.

Steps

1. Accept or change the default settings for the snapshot consistency group as appropriate.

    Field details

Setting	Description
Snapshot consistency group settings	
Name	Specify the name for the snapshot consistency group.
Enable automatic deletion of snapshot images when…	Keep the check box selected if you want snapshot images automatically deleted after the specified limit; use the spinner box to change the limit. If you clear this check box, snapshot image creation stops after 32 images.
Reserved capacity settings	
Alert me when…	Use the spinner box to adjust the percentage point at which the system sends an alert notification when the reserved capacity for a snapshot consistency group is nearing full. When the reserved capacity for the snapshot consistency group exceeds the specified threshold, use the advance notice to increase reserved capacity or to delete unnecessary objects before the remaining space runs out.
Policy for full reserved capacity	Choose one of the following policies: • **Purge oldest snapshot image** — The system automatically purges the oldest snapshot image in the snapshot consistency group, which releases the snapshot image reserved capacity for reuse within the group. • **Reject writes to base volume** — When the reserved capacity reaches its maximum defined percentage, the system rejects any I/O write request to the base volume that triggered the reserved capacity access.

2. After you are satisfied with your snapshot consistency group configuration, click **Finish**.

Create a snapshot volume in SANtricity System Manager

You create a snapshot volume to provide host access to a snapshot image of a volume or snapshot consistency group. You can designate the snapshot volume as either read-only or read-write.

About this task

The snapshot volume creation sequence lets you create a snapshot volume from a snapshot image and provides options to allocate reserved capacity if the volume is read/write. A snapshot volume can be designated as one of the following:

- A read-only snapshot volume provides a host application with read access to a copy of the data contained in the snapshot image, but without the ability to modify the snapshot image. A read-only snapshot volume does not have associated reserved capacity.

- A read-write snapshot volume provides the host application with write access to a copy of the data contained in the snapshot image. It has its own reserved capacity that is used to save any subsequent modifications made by the host application to the base volume without affecting the referenced snapshot image.

The process to create a snapshot volume is a multi-step procedure.

Step 1: Review members for a snapshot volume

Select either a snapshot image of a base volume or a snapshot consistency group. If you select a snapshot consistency group snapshot image, the member volumes of the snapshot consistency group appear for review.

Steps

1. Select **Storage › Snapshots**.

2. Select the **Snapshot Volumes** tab.

3. Select **Create**.

   The Create Snapshot Volume dialog box appears.

4. Select the snapshot image (volume or snapshot consistency group) you want to convert into a snapshot volume, and then click **Next**. Use a text entry in the **Filter** field to narrow down the list.

   If the selection was for a snapshot consistency group snapshot image, the Review Members dialog box appears.

   On the Review Members dialog box, review the list of volumes that are selected for conversion to snapshot volumes, and then click **Next**.

5. Go to Step 2: Assign snapshot volume to host.

Step 2: Assign snapshot volume to host

Select a specific host or host cluster to assign it to the snapshot volume. This assignment grants a host or host cluster access to the snapshot volume. You can choose to assign a host later, if needed.

Before you begin

- Valid hosts or host clusters exist under the Hosts page.

- Host port identifiers must have been defined for the host.

- Before creating a DA-enabled volume, verify that your planned host connection supports the Data Assurance (DA) feature. If any of the host connections on the controllers in your storage array do not support DA, the associated hosts cannot access data on DA-enabled volumes.

About this task

When you assign volumes, keep these guidelines in mind:

- A host's operating system can have specific limits on how many volumes the host can access.

- You can define one host assignment for each snapshot volume in the storage array.

- Assigned volumes are shared between controllers in the storage array.

- The same logical unit number (LUN) cannot be used twice by a host or a host cluster to access a snapshot volume. You must use a unique LUN.

> (i) Assigning a volume to a host fails if you try to assign a volume to a host cluster that conflicts with an established assignment for a host in the host cluster.

Steps

1. On the **Assign to Host** dialog box, select the host or host cluster that you want to assign to the new volume. If you want to create the volume without assigning a host, select **Assign later** from the drop-down list.

2. Select the access mode. Choose one of the following:

   - **Read/write** — This option provides the host with read/write access to the snapshot volume and requires reserved capacity.

   - **Read only** — This option provides the host with read-only access to the snapshot volume and does not require reserved capacity.

3. Click **Next**, and do one of the following:

   - If your snapshot volume is read/write, the Review Capacity dialog box appears. Go to Step 3: Reserve capacity for a snapshot volume.

   - If your snapshot volume is read only, the Edit Priority dialog box appears. Go to Step 4: Edit settings for a snapshot volume.

Step 3: Reserve capacity for a snapshot volume

Associate reserved capacity to a read/write snapshot volume. System Manager suggests the volumes and capacity based on the properties of the base volume or snapshot consistency group. You can accept the recommended reserved capacity configuration or customize the allocated storage.

About this task

You can increase or decrease the reserved capacity for the snapshot volume as needed. If you find that the snapshot reserved capacity is larger than you need, you can reduce its size to free up space that is needed by other logical volumes.

Steps

1. Use the spinner box to allocate the reserved capacity for the snapshot volume.

   The Volume Candidate table displays only the candidates that support the reserved capacity specified.

Do one of the following actions:

- **Accept the default settings**.

  Use this recommended option to allocate the reserved capacity for the snapshot volume with the default settings.

- **Allocate your own reserved capacity settings to meet your data storage needs**.

  If you change the default reserved capacity setting, click **Refresh Candidates** to refresh the candidate list for the reserved capacity you specified.

  Allocate the reserved capacity using the following guidelines.

  - The default setting for reserved capacity is 40% of the capacity of the base volume, and usually this capacity is sufficient.
  - The capacity needed varies, depending on the frequency and size of I/O writes to the volumes and the quantity and duration of snapshot image collection.

2. **Optional:** If you are creating the snapshot volume for a snapshot consistency group, the option to "Change candidate" appears in the Reserved Capacity Candidates table. Click **Change candidate** to select an alternate reserved capacity candidate.
3. Click **Next**, and go to .

Step 4: Edit settings for a snapshot volume

Change the settings for a snapshot volume such as its name, caching, reserved capacity alert thresholds, and so on.

About this task

You can add the volume to solid-state disk (SSD) cache as a way to improve read-only performance. SSD cache consists of a set of SSD drives that you logically group together in your storage array.

Steps

1. Accept or change the settings for the snapshot volume as appropriate.

Field details

Setting	Description
Snapshot volume settings	
Name	Specify the name for the snapshot volume.
Enable SSD Cache	Choose this option to enable read-only caching on SSDs.
Reserved capacity settings	
Alert me when…	**Appears only for a read/write snapshot volume**. Use the spinner box to adjust the percentage point at which the system sends an alert notification when the reserved capacity for a snapshot group is nearing full. When the reserved capacity for the snapshot group exceeds the specified threshold, use the advance notice to increase reserved capacity or to delete unnecessary objects before the remaining space runs out.

2. Review the snapshot volume configuration. Click **Back** to make any changes.

3. When you are satisfied with your snapshot volume configuration, click **Finish**.