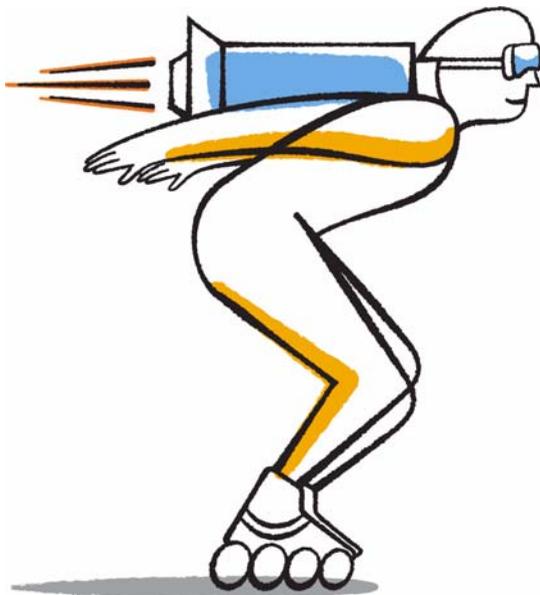




## Data ONTAP<sup>®</sup> 8.1

### Storage Efficiency Express Guide For 7-Mode Administrators Learning Cluster-Mode



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## Deciding whether to use this guide

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If you are familiar with the storage efficiency features in Data ONTAP operating in 7-Mode, and you want to enable and manage deduplication and compression in Cluster-Mode, you should use this express guide.

This guide assumes standard software configurations and NetApp best practices, but does not supply information about all available software options and background descriptions for the tasks.

- This guide assumes that your storage system and Data ONTAP have been successfully installed and a cluster has been created.
- This guide assumes you download and run NetApp OnCommand System Manager 2.0.2 or later for all applicable tasks.

It does not include procedures using the Data ONTAP CLI except when the CLI is the only way to complete a task.

- This guide describes how to configure a system with FlexVol volumes only.  
It does not include information about configuring Infinite Volumes.

For more detailed background information, you should refer to the following documentation:

- *Data ONTAP Software Setup Guide for Cluster-Mode*
- *Data ONTAP System Administration Guide for Cluster-Mode*
- *Data ONTAP Logical Storage Management Guide for Cluster-Mode*
- *Data ONTAP Physical Storage Management Guide for Cluster-Mode*
- *OnCommand System Manager Help* (available both from within the product and as a PDF download)

This documentation is available from the Product Documentation section of the NetApp Support Site.

### Related information

*[Documentation on the NetApp Support Site: support.netapp.com](http://support.netapp.com)*

## **Mode differences in storage efficiency workflows**

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The transition from Data ONTAP operating in 7-Mode to Data ONTAP operating in Cluster-Mode affects the storage efficiency management and monitoring workflows.

The following differences improve storage efficiency operations and workflows:

**Storage efficiency policies**

New in Cluster-Mode. An efficiency policy is similar to a deduplication and compression schedule. The policy allows you to schedule on the minute and to define a duration for the operation. You can apply an efficiency policy to multiple volumes in a Vserver. Changes to the policy apply to all of the volumes that have assigned that policy.

**Enabling deduplication and compression with OnCommand System Manager**

When using System Manager to create volumes, you can simultaneously enable efficiency operations on the volumes.

## Configuring compression and deduplication schedules with storage efficiency policies

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You can create a storage efficiency policy that assigns a time-based schedule for compression and deduplication on a volume.

A storage efficiency policy uses a job schedule to control when deduplication and compression operations are run. You can schedule operations to run at any time on any day of the week. You can also specify the total run time for the operation.

Policies are used to control post-process compression and deduplication operations. When both compression and deduplication are enabled, compression is performed first, followed immediately by deduplication.

A single policy can be assigned to multiple volumes. You can make changes to the compression and deduplication schedules for all of the assigned volumes by changing the policy.

### Creating a cron job schedule for the efficiency policy

A time-based efficiency policy requires a cron job schedule to control the frequency and the start time of the deduplication and compression operations. Cron job schedules are controlled at the cluster level. You can use an existing cron job schedule, or create your own and apply it to your storage efficiency policy.

#### Steps

1. From the **Home** tab, double-click the appropriate storage system.
2. In the navigation pane, click **Cluster > Configuration > Schedule**.

The existing cron schedules are displayed. If there is a schedule that meets your requirements, you can use it when you add an efficiency policy.

3. To create a cron schedule, click **Create**.
4. In the **Create Schedule** dialog box, enter a schedule name.
5. Select **Basic**, **Interval**, or **Advanced** for the type of schedule that you want to create.
6. In the navigation pane, click **cron**.

The cron schedules are displayed, including the one you created.

## Creating an efficiency policy

You can use System Manager to create efficiency policies to control the schedule and run time of deduplication and compression.

### Before you begin

You must have created at least one cron job schedule.

### Steps

1. From the **Home** tab, double-click the appropriate storage system.
2. Select **Vservers** in the navigation pane.
3. In the navigation pane, select the appropriate Vserver and click **Policies > Efficiency Policies**.
4. Click **Add** and specify the policy name.
5. Select the schedule and optionally specify the maximum run time for the policy.
6. Click **Add**.

### Related tasks

[Creating a cron job schedule for the efficiency policy](#) on page 6

[Enabling storage efficiency with an efficiency policy](#) on page 7

## Enabling storage efficiency with an efficiency policy

A storage efficiency policy offers flexibility for scheduling and controlling the duration of the deduplication and compression background processes.

### Before you begin

You must have already created a storage efficiency policy and a cron job schedule.

### Steps

1. From the **Home** tab, double-click the appropriate storage system.
2. In the navigation pane, click **Vservers**.
3. Double-click the appropriate Vserver.
4. Click **Volumes**.

The volumes that have been created on this Vserver are displayed.

5. Click the volume to which you want to assign an efficiency policy.
6. Click **Edit**.
7. In the **Edit Volume** dialog box, click **Storage Efficiency**.
8. Select the **Enable Storage Efficiency** check box.  
The deduplication options are displayed.
9. Select **Scheduled**.
10. Click the **Choose** box.
11. In the **Choose Storage Efficiency Policy** dialog box, select a storage efficiency policy that you want to use.  
The details of the policy that you selected are displayed in the dialog box.
12. Click **Ok** when you have selected the correct policy.
13. Click **Save**.

### Result

Storage efficiency is enabled on the volume.

### Related tasks

[Enabling or disabling efficiency policies](#) on page 8

## Enabling or disabling efficiency policies

You can enable or disable efficiency policies. You might want to suspend the process for a period of time or you might want to stop the process and then enable it under a different schedule or policy.

### About this task

Do not disable a storage efficiency policy that controls efficiency operations that are currently being performed. You must stop the operation or wait for it to complete before disabling the policy.

### Steps

1. From the **Home** tab, double-click the appropriate storage system.
2. Select **Vservers** in the navigation pane.
3. Select the appropriate Vserver and click **Policies > Efficiency Policies**.
4. Select the policy or policies that you want to enable or disable.
5. Click either **Enable** or **Disable**.

6. If you are disabling an efficiency policy, select the confirmation check box and click **OK**.

**Result**

When you disable a policy, storage efficiency operations are disabled on all volumes that have the policy assigned.

## Enabling storage efficiency during volume creation

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You can enable deduplication and compression to run as background processes when you create a volume using System Manager. By default, the background processes runs nightly at midnight.

### Before you begin

The storage system must be configured with Vservers and non-root aggregates before you create a volume.

### Steps

1. From the **Home** tab, double-click the appropriate storage system for which you want to create a volume.
2. In the navigation pane, select the appropriate Vserver and click **Create > Volume**.
3. In the **Create Volume** dialog box, click **General**.
4. Create the volume by entering details in the required fields.
5. Click the **Storage Efficiency** tab.
6. Select the **Enable Storage Efficiency** check box.

Deduplication is enabled. By default, the deduplication background process runs nightly at midnight.

7. Select the **Enable Compression** check box.

Data compression is enabled for post-processing compression. The data compression background process runs nightly at midnight.

### After you finish

You can add inline compression or change the post-process compression and deduplication schedule by modifying the volume's storage efficiency attributes.

### Related concepts

[Configuring compression and deduplication schedules with storage efficiency policies](#) on page 6

## Modifying volume efficiency attributes

When you enable storage efficiency during volume creation, you are limited to the initial setting for deduplication scheduling and post-process compression only. After you have created the volume and set basic storage efficiency attributes, you can modify the attributes to better fit your requirements.

### Steps

1. From the **Home** tab, double-click the appropriate storage system.
2. In the navigation pane, click **Vservers**.
3. Double-click the Vserver in which your volume resides.
4. Click **Volumes**.
5. In the **Volumes** window, click the volume for which you want to modify the storage efficiency attributes.
6. Click **Edit**.
7. In the **Edit Volume** window, click the **Storage Efficiency** tab.
8. In the options that are displayed, modify the deduplication and compression schedule as required.  
You can also enable inline compression.

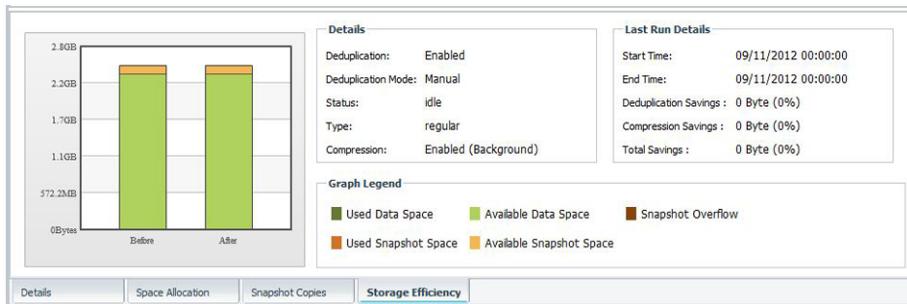
## Monitoring the efficiency status

For each volume that has storage efficiency enabled, you can view statistics from the last deduplication and compression operation that was performed. The deduplication and compression savings are provided as a percentage and as total bytes saved.

### Steps

1. From the **Home** tab, double-click the storage system that you want to monitor.
2. In the navigation pane, click **Vservers**.
3. Double-click the appropriate Vserver.
4. Click **Volumes**.
5. In the **Volumes** window, click the volume for which you want to display the storage efficiency statistics.
6. Click the **Storage Efficiency** tab at the bottom of the **Volumes** window.

The storage efficiency statistics are displayed in a window similar to the following:



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