Cluster management with System Manager

ONTAP 9

NetApp
May 23, 2022

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Administration overview with System Manager

System Manager is a graphical management interface that enables you to use a web browser to manage storage systems and storage objects (such as disks, volumes, and storage tiers) and perform common management tasks related to storage systems.

The procedures in this section help you manage your cluster with System Manager in ONTAP 9.7 and later releases.

- Beginning with ONTAP 9.8, System Manager is no longer available as an executable file and is included with ONTAP software as a web service, enabled by default, and accessible by using a browser.
- The name of System Manager has changed beginning with ONTAP 9.6. In ONTAP 9.5 and earlier it was called OnCommand System Manager. Beginning with ONTAP 9.6 and later, it is called System Manager.
- If you are using the classic System Manager (available only in ONTAP 9.7 and earlier), refer to System Manager Classic (ONTAP 9.0 to 9.7)

Using the System Manager Dashboard, you can view at-a-glance information about important alerts and notifications, the efficiency and capacity of storage tiers and volumes, the nodes that are available in a cluster, the status of the nodes in an HA pair, the most active applications and objects, and the performance metrics of a cluster or a node.

With System Manager you can perform many common tasks, such as the following:

- Create a cluster, configure a network, and set up support details for the cluster.
- Configure and manage storage objects, such as disks, local tiers, volumes, qtrees, and quotas.
- Configure protocols, such as SMB and NFS, and provision file sharing.
- Configure protocols such as FC, FCoE, NVMe, and iSCSI for block access.
- Create and configure network components, such as subnets, broadcast domains, data and management interfaces, and interface groups.
- Set up and manage mirroring and vaulting relationships.
- Perform cluster management, storage node management, and storage virtual machine (storage VM) management operations.
- Create and configure storage VMs, manage storage objects associated with storage VMs, and manage storage VM services.
- Monitor and manage high-availability (HA) configurations in a cluster.
- Configure service processors to remotely log in, manage, monitor, and administer the node, regardless of the state of the node.

System Manager terminology

System Manager uses different terminology than the CLI for some ONTAP key functionality.

- **Local tier** – a set of physical solid-state drives or hard-disk drives you store your data on. You might know these as aggregates. In fact, if you use the ONTAP CLI, you will still see the term *aggregate* used to represent a local tier.
- **Cloud tier** – storage in the cloud used by ONTAP when you want to have some of your data off premises for one of several reasons. If you are thinking of the cloud part of a FabricPool, you've already figured it out. And if you are using a StorageGRID system, your cloud might not be off premises at all. (A cloud-like experience on premises is called a *private cloud*.)
- **Storage VM** – a virtual machine running within ONTAP that provides storage and data services to your clients. You might know this as an *SVM* or a *vserver*.
- **Network interface** - an address and properties assigned to a physical network port. You might know this as a *logical interface (LIF)*.
- **Pause** - an action that halts operations. Before ONTAP 9.8, you might have referred to *quiesce* in other versions of System Manager.

Use System Manager to access a cluster

If you prefer to use a graphic interface instead of the command-line interface (CLI) for accessing and managing a cluster, you can do so by using System Manager, which is included with ONTAP as a web service, is enabled by default, and is accessible by using a browser.

What you'll need

- You must have a cluster user account that is configured with the `admin` role and the `http` and `console` application types.
- You must have enabled cookies and site data in the browser.

About this task

You can use a cluster management network interface (LIF) or node management network interface (LIF) to access System Manager. For uninterrupted access to System Manager, you should use a cluster management network interface (LIF).

Steps

1. Point the web browser to the IP address of the cluster management network interface:

   - If you are using IPv4: **`https://cluster-mgmt-LIF`**
   - If you are using IPv6: **`https://[cluster-mgmt-LIF]`**

   > Only HTTPS is supported for browser access of System Manager.

   If the cluster uses a self-signed digital certificate, the browser might display a warning indicating that the certificate is not trusted. You can either acknowledge the risk to continue the access or install a Certificate Authority (CA) signed digital certificate on the cluster for server authentication.

2. **Optional:** If you have configured an access banner by using the CLI, then read the message that is displayed in the **Warning** dialog box, and choose the required option to proceed.

   This option is not supported on systems on which Security Assertion Markup Language (SAML) authentication is enabled.

- If you do not want to continue, click **Cancel**, and close the browser.
- If you want to continue, click **OK** to navigate to the System Manager login page.

3. Log in to System Manager by using your cluster administrator credentials.

> Beginning with ONTAP 9.11.1, when you log in to System Manager, you can specify the locale. The locale specifies certain localization settings, such as language, currency, time and date format, and similar settings. For ONTAP 9.10.1 and earlier, the locale is detected from the browser. To change the locale, you have to change the locale of the browser.

Related information

Managing access to web services

Accessing a node's log, core dump, and MIB files by using a web browser

Enable new features by adding license keys

Some ONTAP features are enabled by license keys. You can add license keys using System Manager.

Beginning with ONTAP 9.10.1, you use System Manager to install a NetApp License File to enable multiple licensed features all at once. Using a NetApp License File simplifies license installation because you no longer have to add separate feature license keys. You download the NetApp License File from the NetApp Support Site.

If you already have license keys for some features and you are upgrading to ONTAP 9.10.1, you can continue to use those license keys.

Steps

1. Click **Cluster > Settings**.
2. Under **License**, click →.
3. Click **Browse** to locate and select the NetApp License File you downloaded.
4. If you have license keys you want to add, select **Use 28-character license keys** and enter the keys.

View and submit support cases

Beginning with ONTAP 9.9.1, you can view support cases from Active IQ associated with the cluster. You can also copy cluster details that you need to submit a new support case on the NetApp Support Site.

> When working with ONTAP 9.9.1, to receive alerts about firmware updates, you must be registered with Active IQ Unified Manager. Refer to Active IQ Unified Manager documentation resources.

Steps

1. In System Manager, select **Support**.

   A list of open support cases associated with this cluster is displayed.

2. Click on the following links to perform procedures:
    - **Case Number**: See details about the case.
    - **Go to NetApp Support Site**: Navigate to the **My AutoSupport** page on the NetApp Support Site to view knowledge base articles or submit a new support case.
    - **View My Cases**: Navigate to the **My Cases** page on the NetApp Support Site.
    - **View Cluster Details**: View and copy information you will need when you submit a new case.

Monitor risks

Beginning with ONTAP 9.10.0, you can use System Manager to monitor the risks reported by Active IQ Digital Advisor. Beginning with ONTAP 9.10.1, you can use System Manager to also acknowledge the risks.

NetApp Active IQ Digital Advisor reports opportunities to reduce risk and improve the performance and efficiency of your storage environment. With System Manager, you can learn about risks reported by Active IQ and receive actionable intelligence that helps you administer storage and achieve higher availability, improved security, and better storage performance.

Link to your Active IQ account

To receive information about risks from Active IQ, you should first link to your Active IQ account from System Manager.

Steps

1. In System Manager, click **Cluster > Settings**.
2. Under **Active IQ Registration**, click **Register**.
3. Enter your credentials for Active IQ.
4. After your credentials are authenticated, click **Confirm to link Active IQ with System Manager**.

View the number of risks

Beginning with ONTAP 9.10.0, you can view from the dashboard in System Manager the number of risks reported by Active IQ.

Before you begin

You must establish a connection from System Manager to your Active IQ account. Refer to Link to your Active IQ account.

Steps

1. In System Manager, click **Dashboard**.
2. In the **Health** section, view the number of reported risks.

You can view more detailed information about each risk by clicking the message showing the number of risks. See View details of risks.

View details of risks

Beginning with ONTAP 9.10.0, you can view from System Manager how the risks reported by Active IQ are categorized by impact areas. You can also view detailed information about each reported risk, its potential impact on your system, and corrective actions you can take.

Before you begin

You must establish a connection from System Manager to your Active IQ account. Refer to Link to your Active IQ account.

Steps

1. Click **Events > All Events**.
2. In the **Overview** section, under **Active IQ Suggestions**, view the number of risks in each impact area category. The risk categories include:
   - Performance & efficiency
   - Availability & protection
   - Capacity
   - Configuration
   - Security
3. Click on the **Active IQ Suggestions** tab to view information about each risk, including the following:
   - Level of impact to your System
   - Category of the risk
   - Nodes that are affected
   - Type of mitigation needed
   - Corrective actions you can take

Acknowledge risks

Beginning with ONTAP 9.10.1, you can use System Manager to acknowledge any of the open risks.

Steps

1. In System Manager, display the list of risks by performing the procedure in View details of risks.
2. Click on the risk name of an open risk that you want to acknowledge.
3. Enter information into the following fields:
   - Reminder (date)
   - Justification
   - Comments
4. Click **Acknowledge**.

After you acknowledge a risk, it takes a few minutes for the change to be reflected in the list of Active IQ suggestions.

Unacknowledge risks

Beginning with ONTAP 9.10.1, you can use System Manager to unacknowledge any risk that was previously acknowledged.

Steps

1. In System Manager, display the list of risks by performing the procedure in View details of risks.
2. Click on the risk name of an acknowledged risk that you want to unacknowledge.
3. Enter information into the following fields:
   - Justification
   - Comments
4. Click **Unacknowledge**.

After you unacknowledge a risk, it takes a few minutes for the change to be reflected in the list of Active IQ suggestions.

Gain insights to help optimize your system

With System Manager, you can view insights that help you optimize your system.

About this task

Beginning with ONTAP 9.11.0, you can view insights in System Manager that help you optimize the capacity and security compliance of your system.

Beginning with ONTAP 9.11.1, you can view additional insights that help you optimize the capacity, security compliance, and configuration of your system.

Based on best practices, these insights are displayed on one page from which you can initiate immediate actions to optimize your system.

View optimization insights

Steps

1. In System Manager, click **Insights** in the left-hand navigation column.

   The **Insights** page shows groups of insights. Each group of insights might contain one or more insights. The following groups are displayed:

   - Needs your attention
   - Remediate risks
   - Optimize your storage
2. (Optional) Filter the insights that are displayed by clicking these buttons in the upper-right corner of the page:
   - Displays the security-related insights.
   - Displays the capacity-related insights.

-  Displays the configuration-related insights.
-  Displays all of the insights.

Respond to insights to optimize your system

In System Manager, you can respond to insights by either dismissing them, exploring different ways to remediate the problems, or initiating the process to fix the problems.

Steps

1. In System Manager, click **Insights** in the left-hand navigation column.
2. Hover over an insight to reveal the buttons to perform the following actions:
   - **Dismiss**: Remove the insight from the view. To “undismiss” the insight, refer to Customize the settings for insights.
   - **Explore**: Find out various ways to remediate the problem mentioned in the insight. This button appears only if there is more than one method of remediation.
   - **Fix**: Initiate the process of remediating the problem mentioned in the insight. You will be asked to confirm whether you want to take the action needed to apply the fix.

Some of these actions can be initiated from other pages in System Manager, but the **Insights** page helps you streamline your day-to-day tasks by allowing you to initiate these action from this one page.

Customize the settings for insights

You can customize which insights you will notified about in System Manager.

Steps

1. In System Manager, click **Insights** in the left-hand navigation column.
2. In the upper-right corner of the page, click ⋮, then select **Settings**.
3. On the **Settings** page, ensure there is a check in the check boxes next to the insights you want to be notified about. If you previously dismissed an insight, you can “undismiss” it by ensuring a check is in its check box.
4. Click **Save**.

Export the insights as a PDF file

You can export all applicable insights as a PDF file.

Steps

1. In System Manager, click **Insights** in the left-hand navigation column.
2. In the upper-right corner of the page, click ⋮, then select **Export**.

View hardware configurations to determine problems

With ONTAP 9.8 and later, you can use System Manager to view the configuration of

hardware on your network and determine if problems might arise.

Steps

To view hardware configurations, perform the following steps:

1. In System Manager, select **Cluster > Hardware**.
2. Hover your mouse over components to view status and other details.

   You can view various types of information:

   - Information about controllers
   - Information about disk shelves
   - Information about storage switches

Information about controllers

You can view the following:

Nodes

Nodes:

- Front and rear views are displayed.
- Models with an internal disk shelf also show the disk layout in the front view.
- You can view the following platform models:

If your system is running…	Then you can use System Manager to view…
ONTAP 9.8	A220, A300, A400, A700, and C190 (Only a *preview* of this feature is available.)
ONTAP 9.9.1	A220, A250, A300, A320, A400, A700, A700s, A800, C190, and FAS500f
ONTAP 9.10.1	A220, A250, A300, A320, A400, A700, A700s, A800, A900, C190, and FAS500f.
ONTAP 9.11.1	A220, A250, A300, A320, A400, A700, A700s, A800, A900, C190, FAS2720, FAS2750, FAS500F, FAS8300, FAS8700, and FAS9000

Ports

Ports:

- Console ports are not shown.
- A port is red if it is down.
- The status of a port and other details are shown when you hover over the port.

  Notes:

  - For ONTAP 9.10.1 and earlier, SAS ports are displayed in red when they are disabled.
  - Beginning with 9.11.1, SAS ports are highlighted in red only if they are in an error state or if a cabled port that is being used goes offline. The ports are shown in white if they are offline and uncabled.

FRUs

FRUs:

Information about FRUs appears only when the state of a FRU is non-optimal.

- Failed PSUs in nodes or chassis.
- High temperatures detected in nodes.
- Failed fans on the nodes or chassis.

Adapter cards

Adapter cards:

- Cards with defined part number fields are shown in the slots if external cards have been inserted.

- Ports on cards are shown.
- Certain cards are shown with specific images of the cards. If the card is not in the list of supported part numbers, then a generic graphic is displayed.

Information about disk shelves

You can view the following:

Disk shelves

Disk shelves:

- Front and rear views are displayed.
- You can view the following disk shelf models:

If your system is running…	Then you can use System Manager to view…
ONTAP 9.8	DS4243, DS4486, DS212C, DS2246, DS224C, and NS224
ONTAP 9.9.1 and later	All non-EOS and non-EOA shelves

Shelf ports

Shelf ports:

- Port status is displayed.
- Remote port information is shown if the port is connected.

Shelf FRUs

Shelf FRUs:

- PSU failure information is shown.

Information about storage switches

You can view the following:

Storage switches

Storage switches:

- The display shows switches that act as storage switches used to connect shelves to nodes.
- Beginning with 9.9.1, System Manager displays information about a switch that acts as both a storage switch and a cluster, which can also be shared between nodes of an HA pair.
- The following information is displayed:
  - Switch name
  - IP address
  - Serial number
  - SNMP version
  - System version
- You can view the following storage switch models:

If your system is running…	Then you can use System Manager to view…
ONTAP 9.8	Cisco Nexus 3232C Switch
ONTAP 9.9.1 and 9.10.1	Cisco Nexus 3232C Switch Cisco Nexus 9336C-FX2 Switch
ONTAP 9.11.1	Cisco Nexus 3232C Switch Cisco Nexus 9336C-FX2 Switch Mellanox SN2100 Switch

Storage switch ports

Storage switch ports

- The following information is displayed:
  - Identity name
  - Identity index
  - State
  - Remote connection
  - Other details

Add (create) a local tier using System Manager

You can use System Manager to create local tiers to add to your storage solution.

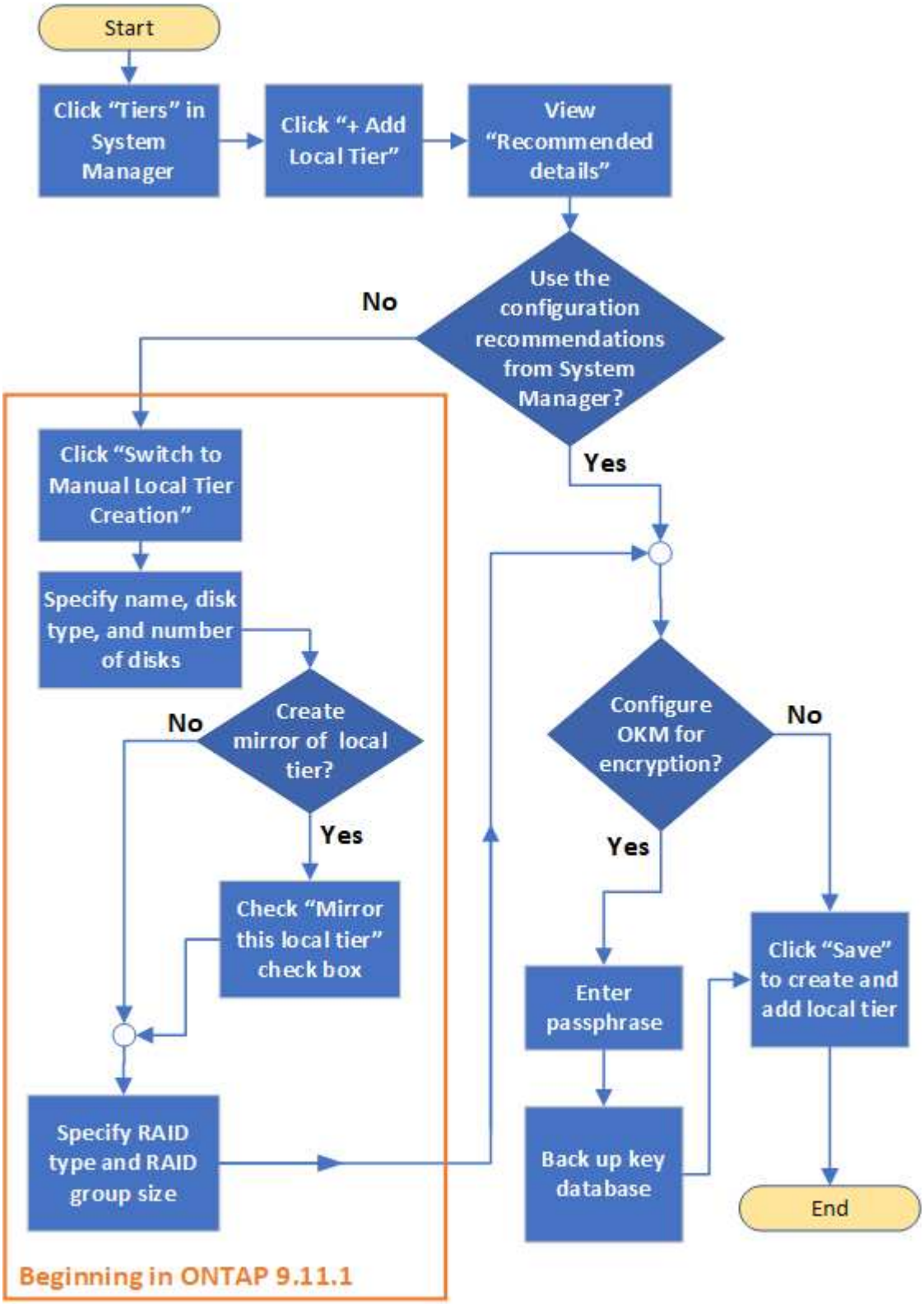
About this task

System Manager creates local tiers based on recommended best practices for configuring local tiers.

Beginning with ONTAP 9.11.1, you can decide to configure local tiers manually if you want a different configuration than the one recommended during the automatic process to add a local tier.

- Add a local tier automatically
- Add a local tier manually using System Manager

Workflow for adding a local tier



Add a local tier automatically

Steps

1. In System Manager, click **Storage > Tiers**.
2. From the **Tiers** page, click + Add Local Tier to create a new local tier:

   The **Add Local Tier** page shows the recommended number of local tiers that can be created on the nodes and the usable storage available.

3. Click **Recommended details** to view the configuration recommended by System Manager.

   System Manager displays the following information beginning with ONTAP 9.8:

   - **Local tier name** (you can edit the local tier name beginning with ONTAP 9.10.1)
   - **Node name**
   - **Usable size**
   - **Type of storage**

   Beginning with ONTAP 9.10.1, additional information is displayed:

   - **Disks**: showing the number, size, and type of the disks
   - **Layout**: showing the RAID group layout, including which disks are parity or data and which slots are unused.
   - **Spare disks**: showing the node name, the number and size of spare disks, and the type of storage.

4. Perform one of the following steps:

If you want to…	Then do this…
Accept the recommendations from System Manager	Proceed to Step 5.
Manually configure the local tiers and ***not*** use the recommendations from System Manager	• For ONTAP 9.10.1 and earlier, use the CLI to add a local tier manually. • Beginning with ONTAP 9.11.1, complete the steps in Add a local tier manually using System Manager

5. (Optional): If the Onboard Key Manager has been installed, you can configure it for encryption. Check the **Configure Onboard Key Manager for encryption** check box.
   a. Enter a passphrase.
   b. Enter the passphrase again to confirm it.
   c. Save the passphrase for future use in case the system needs to be recovered.
   d. Back up the key database for future use.
6. Click **Save** to create the local tier and add it to your storage solution.

Add a local tier manually using System Manager

Beginning with ONTAP 9.11.1, If you do not want to use the configuration recommended by System Manager

to create a local tier, you can specify the configuration you want.

Steps

1. Complete Steps 1 through 3 in Add a local tier automatically.
2. When System Manager displays the storage recommendation for the local tier, click **Switch to Manual Local Tier Creation** in the **Spare Disks** section.

   The **Add Local Tier** page displays fields that you use to configure the local tier.
3. In the first section of the **Add Local Tier** page, complete the following:
   a. Enter the name of the local tier.
   b. (Optional): Check the **Mirror this local tier** check box if you want to mirror the local tier.
   c. Select a disk type.
   d. Select the number of disks.
4. In the **RAID Configuration** section, complete the following:
   a. Select the RAID type.
   b. Select the RAID group size.
   c. Click RAID allocation to view how the disks are allocated in the group.
5. (Optional): If the Onboard Key Manager has been installed, you can configure it for encryption in the **Encryption** section of the page. Check the **Configure Onboard Key Manager for encryption** check box.
   a. Enter a passphrase.
   b. Enter the passphrase again to confirm it.
   c. Save the passphrase for future use in case the system needs to be recovered.
   d. Back up the key database for future use.
6. Click **Save** to create the local tier and add it to your storage solution.

Edit a local tier using System Manager

You can use System Manager to rename a local tier or modify its RAID configuration.

Rename a local tier

Beginning with ONTAP 9.10.1, you can modify the name of a local tier.

Steps

1. In System Manager, click **Storage > Tiers**.
2. Click ⋮ next to the name of the local tier.
3. Select **Rename**.
4. Specify a new name for the local tier.

Edit the RAID configuration of a local tier

Beginning with ONTAP 9.11.1, you can modify the RAID configuration of a local tier.

Steps

1. In System Manager, click **Storage > Tiers**.
2. Click ⋮ next to the name of the local tier.
3. Select **Edit RAID Configuration**.
4. The **Edit RAID Configuration** page displays. You can modify any of the fields:

    a. Select a disk type.

    This field is not displayed for local tiers with a mixed RAID type.

    b. Select a RAID type.

    c. Select the RAID group size.

> ⓘ If you modify the RAID type, the RAID group size cannot be modified and vice versa. To modify both fields, you should modify one field, save the configuration, then repeat this editing process to modify the other field.

Related information

Refer to Add (create) a local tier to create a local tier.

Add capacity to a local tier (Add disks to an aggregate)

You can use System Manager to increase the size of an existing local tier (aggregate) by adding capacity disks.

The process you use to increase capacity depends on the version of ONTAP that you have installed:

If you have installed…	Then increase capacity with this process…
ONTAP 9.7 or earlier	Increase the capacity of an aggregate (ONTAP 9.7 or earlier)
ONTAP 9.8 or later	Increase the capacity of a local tier (ONTAP 9.8 or later)

Increase the capacity of an aggregate (ONTAP 9.7 or earlier)

Using System Manager with ONTAP 9.7 or earlier, you can add capacity to an aggregate by adding capacity disks.

About this task

You perform this task only if you have installed ONTAP 9.7 or earlier. If you installed ONTAP 9.8 or later, refer to Increase the capacity of a local tier (ONTAP 9.8 or later).

Steps

1. Click **(Return to classic version)**.
2. Click **Hardware and Diagnostics > Aggregates**.
3. Select the aggregate to which you want to add capacity disks, and then click **Actions > Add Capacity**.

> ⓘ You should add disks that are of the same size as the other disks in the aggregate.

4. Click **Switch to the new experience**.
5. Click **Storage > Tiers** to verify the size of the new aggregate.

Increase the capacity of a local tier (ONTAP 9.8 or later)

Using System Manager with ONTAP 9.8 or later, you can add capacity to a local tier by adding capacity disks.

About this task

You perform this task only if you have installed ONTAP 9.8 or later. If you installed an earlier version of ONTAP, refer to Increase the capacity of an aggregate (ONTAP 9.7 or earlier).

Steps

1. Click **Storage > Tiers**.
2. Click ⋮ next to the name of the local tier to which you want to add capacity.
3. Click **Add Capacity**.

> ⓘ If there are no spare disks that you can add, then the **Add Capacity** option is not shown, and you cannot increase the capacity of the local tier.

4. Perform the following steps, based on the version of ONTAP that is installed:

If this version of ONTAP is installed…	Perform these steps…
ONTAP 9.8, 9.9, or 9.10.1	1. If the node contains multiple storage tiers, then select the number of disks you want to add to the local tier. Otherwise, if the node contains only a single storage tier, the added capacity is estimated automatically. 2. Click **Add**.
ONTAP 9.11.1	1. Select the disk type and number of disks. 2. If you want to add disks to a new RAID group, check the check box. The RAID allocation is displayed. 3. Click **Save**.

5. (Optional) The process takes some time to complete. If you want to run the process in the background, select **Run in Background**.
6. After the process completes, you can view the increased capacity amount in the local tier information at **Storage > Tiers**.

Add cache to a local tier

To provision a solid-state drive (SSD) cache, convert an existing local tier (aggregate) to a Flash Pool aggregate by adding SSDs. Flash Pool aggregates enable you to deploy Flash as a high-performance cache for your working dataset while using lower-cost HDDs for less frequently accessed data.

The process you use to provision an SSD cache and add it to a local tier depends on the version of ONTAP that you have installed.

If you use this version of ONTAP…	Then perform this procedure…
ONTAP 9.8 or later	Use the CLI to create an SSD storage pool
ONTAP 9.7	Use System Manager to add an SSD cache (ONTAP 9.7 only)

Use the CLI to create an SSD storage pool

Using the CLI in ONTAP 9.8 or later, create SSD storage pools to provide an SSD cache for two to four Flash Pool aggregates.

Steps

1. Perform the procedure to Create an SSD storage pool.

Use System Manager to add an SSD cache (ONTAP 9.7 only)

Steps

1. Click **(Return to classic version)**.
2. Click **Storage > Aggregates & Disks > Aggregates**.
3. Select the local tier (aggregate), and then click **Actions > Add Cache**.
4. Select the cache source as "storage pools" or "dedicated SSDs".
5. Click **(Switch to the new experience)**.
6. Click **Storage > Tiers** to verify the size of the new aggregate.

Manage nodes

Reboot, shut down, take over, and give back nodes

You should switch a node's workload to its HA partner (takeover) before rebooting or shutting down the node.

Steps

1. Click **Cluster > Overview**.
2. Under **Nodes**, click ⋮.
3. Click the node and select the desired action.

Add nodes to cluster

You can increase the size and capabilities of your cluster by adding new nodes.

Before you Start

You should have already cabled the new nodes to the cluster.

There are separate processes for working with System Manager in ONTAP 9.7 or ONTAP 9.8.

- Adding nodes to a cluster with System Manager (ONTAP 9.7)
- Adding nodes to a cluster with System Manager (ONTAP 9.8)

Adding nodes to a cluster with System Manager (ONTAP 9.7)

Steps

1. Click **(Return to classic version)**.
2. Click **Configurations > Cluster Expansion**.

   System Manager automatically discovers the new nodes.

3. Click **Switch to the new experience**.
4. Click **Cluster > Overview** to view the new nodes.

Adding nodes to a cluster with System Manager (ONTAP 9.8)

Steps

1. Select **Cluster > Overview**.

   The new controllers are shown as nodes connected to the cluster network but are not in the cluster.

2. Click **Add**.
   - The nodes are added into the cluster.
   - Storage is allocated implicitly.