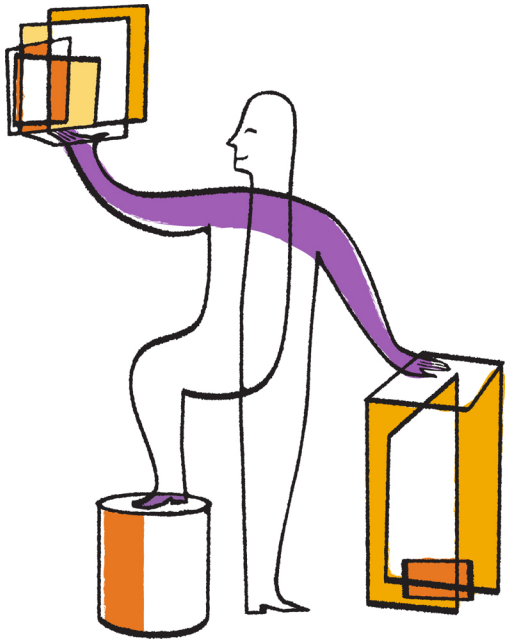
OnCommand® Insight 7.1

Planning Guide



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OnCommand Insight Plan features

OnCommand Insight includes planning features, which provide near real-time visibility into global resource allocations, rule-based automated service tier management, and utilization and chargeback data. Storage administrators can use these features to help in automating the storage request and delivery processes.

The OnCommand Insight Plan features include:

- Capacity utilization reports by tiers and data centers.
- Chargeback reports that show historical storage consumption by business entity (tenant, line of business, business unit, and project).
- An API to perform requests and requirements and see reservations.

These features offer the following benefits:

- Supports your request process by providing visibility into near real-time resource allocation.
- Assists with future demands by being able to identify existing utilization and outstanding reservations.
- Reduces the time needed to provision services.

  Note: OnCommand Insight assists with the implementation of storage policies and procedures, but does not perform any task related to virtualizing servers or provisioning storage.

- Assists in the creation and enforcement of a storage tiering strategy.
- Uses the service information discovered by OnCommand Insight to organize requests for storage resources.

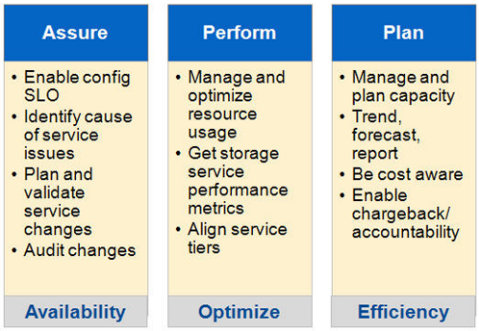
OnCommand Insight product portfolio

OnCommand Insight is a suite of products that boost the quality and efficiency of your storage environment by providing near real-time visibility, multi-vendor and multi-protocol support, and end-to-end service-level views of your application storage path.

The OnCommand Insight portfolio provides the tools for you to manage your environment. You can do the following:

- Optimize the assets that you have on the floor, according to space, performance, and usage criteria.
- Optimize the business activities, such as application or storage service, on your assets.

The OnCommand Insight portfolio includes the following products:



OnCommand Insight Assure

Helps administrators focus on maintaining storage service on their storage resources. Lets administrators establish global, application, host, or path-based service policies and manage the effects of change, risk, and service-level violations of those policies on availability and performance.

OnCommand Insight Perform

Helps administrators focus on their storage resources. Collects and maintains service performance information to help administrators reclaim under-utilized storage resources, manage tiers, analyze storage virtualization efficiency, improve load balancing, troubleshoot congestion and contention, and improve resource utilization to optimize services.

OnCommand Insight Plan

Helps administrators focus on both storage resources and the services on those assets. Provides administrators with an end-to-end view of resource order, the storage allocation process, and trend usage so that they can manage resource reservations and forecast consumption and resource needs. Administrators can report on costs for storage services by business entity or tier and use this information for chargebacks on storage usage. Business level roll-up reporting helps storage administrators improve capacity planning and optimize consumption by application and tier.

OnCommand Insight Assure, OnCommand Insight Perform, and OnCommand Insight Plan use the same integrated discovery component. This discovery component provides visibility into storage availability, resource inventory, and host-to-storage access paths. Administrators can also gain visibility into the path from virtual machines to arrays for organizations deploying VMware ESX technology combined with VMware vCenter (VirtualCenter) technology.

The Inventory features are the foundation features for the OnCommand Insight suite and are used in OnCommand Insight Assure, OnCommand Insight Perform, and OnCommand Insight Plan.

OnCommand Insight Assure, OnCommand Insight Perform, and OnCommand Insight Plan also use the same report authoring tools and the same Data Warehouse platform.

What you can do with OnCommand Insight Plan

Using OnCommand Insight Plan, administrators can view the end-to-end storage resource order and storage allocation process so that they can manage resource reservations and forecast consumption and resource needs.

Administrators can do the following tasks:

- Accelerate data center consolidations. Relevant VM, storage system and network switch information from multiple OnCommand Insight Plan instances can be aggregated into a single view thus providing you with a global view of your asset usage.

- Improve capacity planning by tracking incoming storage requests and capacity trending and then supplying detailed information to support capacity planning.
- Simplify provisioning by checking plans for compliance with preset policies and when a provisioning task is completed, confirming that all plan steps were executed correctly.
- Using OnCommand Insight Plan Data Warehouse, you can view capacity-related reports, such as chargeback, consumption analysis, and forecasting reports.

OnCommand Insight Plan is not an automated storage provisioning tool. All requests are manually implemented using tools other than OnCommand Insight. Also, using OnCommand Insight Plan does not replace the need for storage policies and procedures; the product assists in implementing them.

How OnCommand Insight Plan can speed data center consolidation

OnCommand Insight Plan can accelerate data center consolidation, for instance in an acquisition.

By using these OnCommand Insight features, you can accomplish the following preparatory and analytical tasks:

- Establish how much of each storage resource is being used in each acquired data center.
- Identify and compare technologies used in the parent company and acquired data centers.
- Document relationships between acquired applications and infrastructure components.

The resulting information helps you perform the following tasks:

- Generate a reliable, timely estimate of infrastructure and effort required for consolidation.
- Efficiently locate migrated applications and resources in the remaining data centers.
- Prioritize migration activities to reduce duplicated effort and minimize the time to value.

How OnCommand Insight Plan can improve capacity planning

By using OnCommand Insight Plan, you can deliver an accurate and timely capacity plan.

Use OnCommand Insight Plan to perform the following tasks:

- Manage reservations of different resources.
- Track outstanding requests for ports and capacity.
- Report costs associated with each reservation requirement.
- Record reservations for specific volumes, capacity, and ports.
- Register the fulfillment of resource requests.

The resulting information enables capacity managers to do the following:

- Quantify the demand for reserved resources.
- Forecast capacity needs based on past, current, and future demands.
- Perform chargeback for storage services.
- Optimize consumption by application and tier.

How OnCommand Insight Plan can simplify provisioning

Storage administrators can use OnCommand Insight Plan to define service provisioning action plans to allocate capacity for new or existing hosts and applications.

OnCommand Insight Plan checks plans for compliance with pre-configured rules, and when a provisioning task has been completed, confirms that all plan steps have been executed correctly. This enables storage administrators to provision applications quickly, correctly, and with minimal intervention from senior staff.

What questions you can answer with OnCommand Insight Plan

Using OnCommand Insight Plan, administrators can more effectively manage resource requests, costs involved, resource requirements, and reservation status.

OnCommand Insight Plan helps answer these resource planning questions:

- What requests (for capacity and ports) are outstanding?
- What reservations for volumes, capacity, and ports are outstanding?
- Which requests for resources have been fulfilled?
- What are the costs associated with each reservation requirement?
- What is the demand for reserved resources?
- What violations have been levied against the reservations? (Requires the OnCommand Insight Assure license)

Where to find more information about OnCommand Insight

You can find more information about OnCommand Insight on the NetApp Support Site and in other OnCommand Insight documentation.

OnCommand Insight on the web

For comprehensive, up-to-date information about OnCommand Insight, use these NetApp web site resources.

- OnCommand Insight product web site at *www.netapp.com/oncommandinsight*
- The NetApp Support Site at: *mysupport.netapp.com*
- The OnCommand Insight data source Interoperability Matrix at *mysupport.netapp.com/matrix*.

Product documentation

You can access the OnCommand Insight guides at the NetApp Support Site to learn how to use the product.

You can access the following documents from the NetApp Support Site at *mysupport.netapp.com/documentation/productsatoz/index.html*:

OnCommand Insight Installation Guide for Microsoft Windows

Describes the installation prerequisites and procedures for the web-based interface version of OnCommand Insight.

OnCommand Insight Getting Started Guide

Helps new OnCommand Insight users set up and customize their installed system and begin using it for improved efficiency.

OnCommand Insight Configuration and Administration Guide

Provides an overview of suite architecture, including instructions for starting your system, discovering the logical and physical storage resources in your storage environment, and performing administrative tasks.

Also, describes the configuration parameters and some installation procedures for data sources used by OnCommand Insight and provides recommended methods of discovering your storage environment for the OnCommand Insight deployment.

OnCommand Insight Inventory User Guide

Provides information about the tools and features of your SAN or NAS inventory environment. The Inventory features are the foundation used by all other products in the OnCommand Insight suite. After looking at the *OnCommand Insight Getting Started Guide*, use this guide to learn about basic features common across all OnCommand Insight modules.

OnCommand Insight Assurance User Guide

Provides an overview of how to use OnCommand Insight to analyze and validate your storage network environment and to automate monitoring of operations, as well as procedures for making safe changes without disrupting availability.

OnCommand Insight Performance User Guide

Provides an overview of how to use OnCommand Insight to reclaim underutilized resources, manage tiers, identify multipath risks, and troubleshoot ongoing performance bottlenecks.

OnCommand Insight Planning User Guide

Provides an overview of how to use OnCommand Insight to enable educated capacity management decisions by managing the end-to-end resource order and allocation process.

Also, describes how system administrators can communicate storage capacity requirements to SAN managers using OnCommand Insight Connect Applications web access instead of the full OnCommand Insight feature set.

OnCommand Insight Reporting Guide

Describes reports from the centralized reports portal that support viewing critical inventory and capacity-related information from the data warehouse.

Also describes the metadata model upon which OnCommand Insight reports are based.

Information in this guide is also available from the OnCommand Insight Data Warehouse portal and in the OnCommand Insight Reporting Connection.

OnCommand Insight Data Warehouse Administration Guide

Describes a data warehouse repository that consolidates multiple OnCommand Insight operational databases in an easy-to-query format.

OnCommand Insight Connect API Reference

Provides an overview of how to use the API interface to enable integration with other applications, such as reporting and monitoring systems. Helps customers and independent software vendors (ISVs) to develop applications using the OnCommand Insight API interface.

Defining workflow rules and policies

You can define rules and policies in Settings that enable you to take full advantage of Insight Plan resource allocation features.

You can define rules and policies in Settings to define these resource allocation tasks:

- Automatically assigning tiers and service levels to your devices
- Tracking and reporting on costs associated with particular resources
- Setting the boundaries for resource reservations in your environment

Defining the necessary rules and policies can save time and provide you with beneficial information for your reports. You need to define these rules and policies:

- Service levels
- Tier annotation rules
- Reservation policies
- Cost accounting

Managing tier annotation rules for automatic assignment

To assign annotations automatically to devices based on criteria that you define, you configure tier annotation rules in Settings. Insight assigns the annotations to devices based on these rules, for example, assign Tier 1 to all storage pools in a particular family.

About this task

Annotations set manually on an individual device take precedence over rule-based annotations configured in Settings.

Configuring tier annotation rules for automatic assignment

You can define tier quality rules for volumes, internal volumes, storage arrays, and storage pools that govern the automatic assignment of annotations to devices.

Before you begin

To configure these rules, the Insight Plan license must be installed.

Additionally, the tier annotation type values (for example, "Gold," "Silver," and "Bronze") should already be defined (in **Tools > Settings > Annotations > Types**). Although you can edit the annotation types while you are configuring the rules, it is a good practice to define the types ahead of time.

About this task

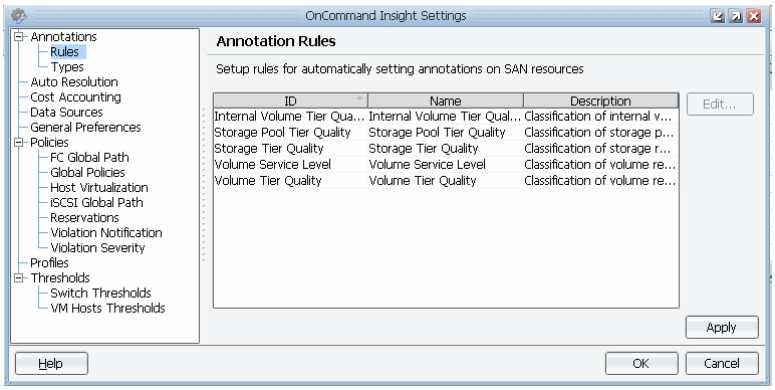
The process of configuring annotation rules is the same for any of the tier annotation rules (volumes, internal volumes, storage arrays, or storage pools). The following steps describe setting volume tier rules.

Note: Annotations also include volume service levels and automatic storage tiering; however, the criteria are slightly different.

Steps

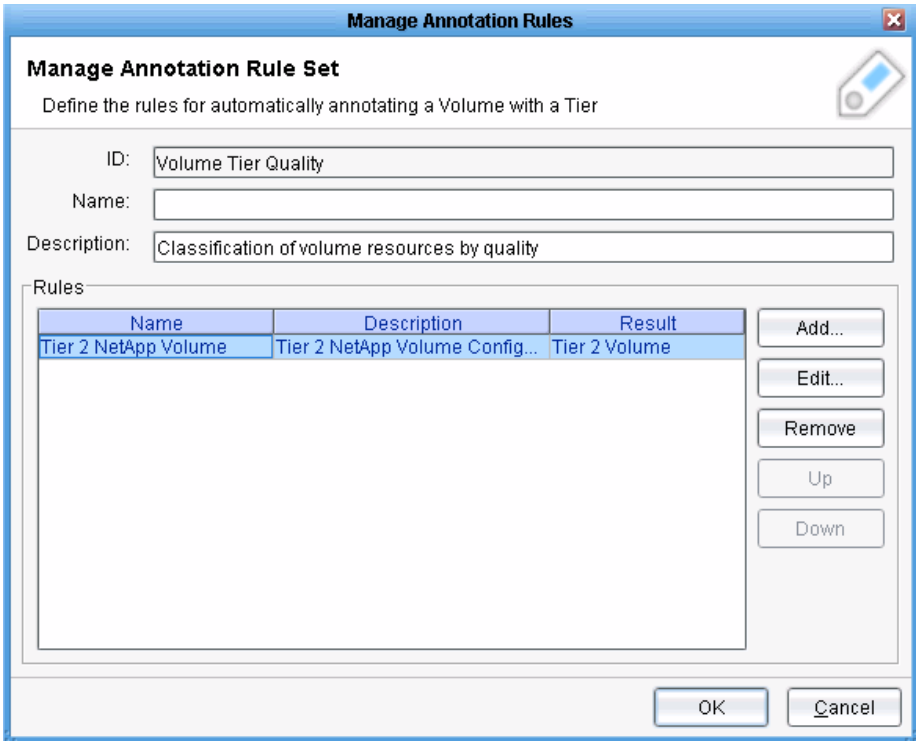
1. From the Insight Client menu, select **Tools > Settings > Annotations > Rules**.

   The Annotation Rules view displays the list of existing annotation rule sets. You can add more rules to the sets and edit the existing rules.

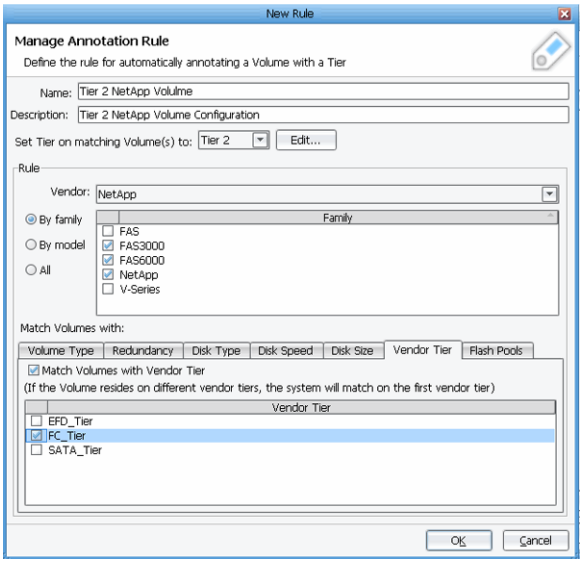


2. In the **Annotation Rules** view, select a rule set for the type of device for which you want to set the tier and click **Edit**.

   For example, select the Volume Tier Quality rule set to automatically assign a tier to volume objects.



3. In the **Manage Annotation Rules** view, either select the rule and click **Edit** or click **Add** to add a new rule.



4. In the **New Rule** dialog box, enter the following:

   Name

   Enter a name that describes the rule, for example, Tier 1 Volume HDS. This name will appear in the Manage Annotation Rules dialog.

   Description

   Enter a description that further clarifies the tier rule.

   Set Tier on matching volume(s) to

   Select an annotation value, such as Tier 2 Volume. These values were set in the Annotation Type option.

5. In the Rule section, select the vendor for this tier.

6. Optionally, click one of the following and check the specific models or families that will automatically receive this tier annotation.

   By family

   For the selected vendor, filtering by family displays all the families for this vendor in the table to the right of this radio button. Selecting a family assigns the tier value only to those storage arrays that match the selected family.

   By model

   For the selected vendor, filtering by model displays all the models of all the families in the table to the right of this radio button. Selecting a model assigns the tier value only to those storage arrays that match the selected model.

   For all

   For the selected vendor, this displays all models without any filters. Selecting all assigns the tier value to all storage arrays for that vendor.

7. Optionally, select only the devices for this tier that match your criteria of volume type, redundancy, disk type, disk speed, disk size, or vendor tier. In each tab, first check the option and then select the specific attributes.

8. Optionally, click the **Flash Pools** tab.

   With automatic storage tiering in place, storage pools, volumes, or internal volumes can be automatically assigned to a tier according to whether those devices are associated with storage pools using Flash Pool aggregate technology.

In the Flash Pools tab, select the **Match Volume with Storage Pools using Flash Pools** option.

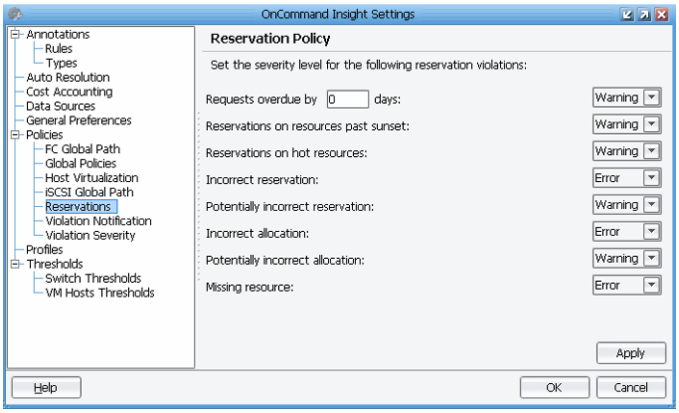
9. Click **OK**.

Setting up the reservation policy

The reservation policy lets you set the severity for available reservation violations. This policy is applied to all reservations.

Steps

1. From the Client menu, select **Tools > Settings**.
2. In the **Settings** window, expand the Policies tree.
3. Select **Reservations**.



4. Select Warning, Error, or Ignore for each field. The violation severity can be set to error or warning, or the violation can be ignored.
5. Click **OK**.

Setting costs for resources

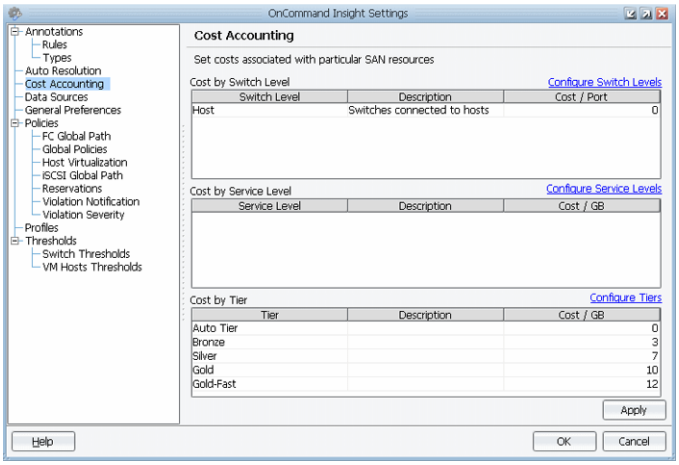
You can associate a cost with a particular resource. OnCommand Insight automates the process of tracking, recording and analyzing the costs you have defined.

About this task

Before generating financial information reports such as the SAN Utilization report, you need to assign cost values to the tiers, service levels, and switch levels you have defined under Annotation Types. See the *OnCommand Insight Inventory User Guide* for more information on defining Annotation Types.

Steps

1. From the OnCommand Insight Client menu, select **Tools > Settings**.
2. In the **Settings** window, click **Cost Accounting**.



3. Double-click on the cost values that appear in the far right columns to convert the field to an Edit pane.
4. Make the desired changes to the values.

Submitting and fulfilling storage requests

You can submit a request for storage capacity and resources through either the Internet-based Request Portal or the OnCommand Insight Client. Only system administrators with full access to the OnCommand Insight system can complete and fulfill the storage requests.

Anyone wanting to make a storage request can use the Internet-based Request Portal to describe the storage capacity and port requirements to the SAN manager. This portal is available at this URL: `http://<hostName>/request-home/index.do`.

To create a complete storage request, the administrator must be certain these three elements are included:

- Request Form describing the storage needs and supplies information about the requestor and the project.
- Target Specification defining hosts needed.
- Requirements Specification listing the number of switch ports, the number and the size of LUNs, and the level of service.

In order to fulfill the completed requests, the administrator must create reservations using OnCommand Insight with a Plan license installed.

Making storage requests through the Client

You create storage requests in stages beginning with the basic information at the top of the Edit Request window. The host target and requirement specifications are added in the tabbed areas of the Edit Request window.

Before you begin

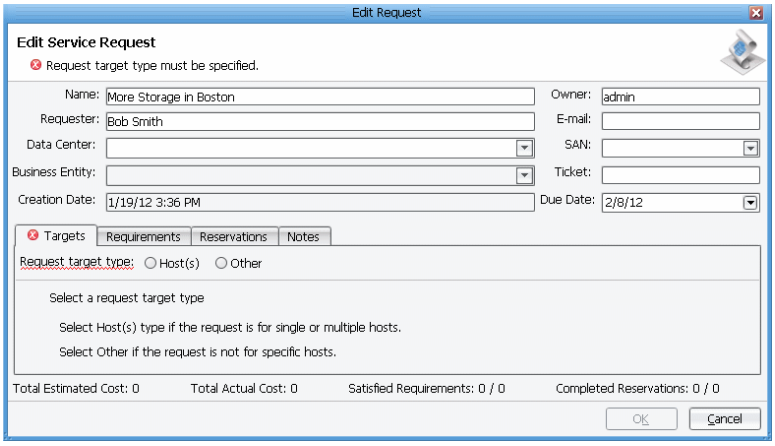
You must have installed OnCommand Insight to use this request method. If you do not have access to the OnCommand Insight system, you can submit storage requests through the Internet-based Request Portal.

Steps

1. From the OnCommand Insight Client, select **Planning** > **Requests**.
2. In the Requests view, right-click and select **Create Request** or select **Action** > **Create Request**.
3. At the top of the **Edit Request** window, you must enter values in any field with a red line under the field name. These are the required fields:
   - **Name** is the title of the request describing the type of request.
   - **Requester** is the name or job title of the person entering the request.
   - **Due Date** specifies when the request must be fulfilled. This date is used to generate overdue violations, so it should be a reasonable date within the scope of the project.

Example

This example shows the Edit Request window with only the required fields entered.



4. Use the remaining fields at the top of the **Edit Request** window to specify how the request should be fulfilled.

   Selections in the following fields are not required; however, you can use them to set specifications for your request and tie the request to your company's structure and processes:

   - **Data Center** is the name of the data center where the new capacity is required. The menu selections list your company's data center names entered into the OnCommand Insight annotations.
   - **Business Entity** is a tenant, line of business, business unit, and project selected from a list of business entities defined in OnCommand Insight. Business entity is formatted in the drop-down menu as <tenant>.<line of business>.<business unit>.<project>.
   - **Owner** is the name or title of the person responsible for fulfilling this request.
   - **Email** is the address used to send email notifications to the requester relating to this request.
   - **SAN** is a list of the annotations defining specific devices in your storage environment. Selecting specific SAN devices restricts reservations for this request to those devices.

     Note: If no items are listed, the predefined SAN annotation was not set up in your OnCommand Insight environment.

   - **Ticket** is a code that your company uses to track capacity requests.
   - **Creation Date** is the date the request is generated. This field is filled automatically.

After you finish

In the Edit Request window, click the **Targets** tab to specify the device for this request.

Request details in reports

Information about requests is sent to OnCommand Insight Data Warehouse. You can generate predesigned reports or create your own reports using the reporting engine.

For example, capacity that has been requested is marked as "requested." This information is sent to Data Warehouse where it can be included in reports to show how much capacity has been requested as compared to how much is actually used.

Only requests for capacity and ports are sent to Data Warehouse for reporting. Information about reservations is not sent to Data Warehouse.

Selecting targets for storage requests

You need to indicate whether the storage request you are defining requires a new or an existing host or is simply reserving space as it would for a planned migration.

Before you begin

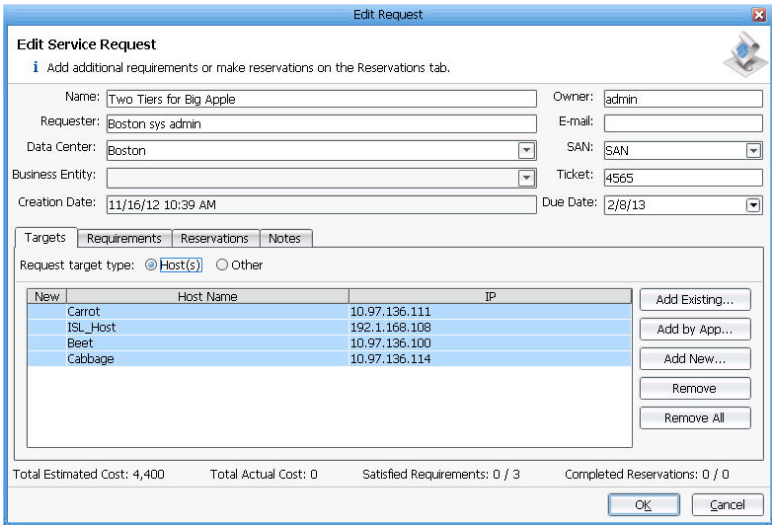
You must first enter the basic request information at the top of the Edit Request window before entering the specifications for your request in the Targets and Requirements tabbed areas.

Steps

1. In the **Edit Request** window, click the **Targets** tab.
2. Select one of these options:
   - **Hosts** indicates that you are requesting additional capacity in existing or new hosts.
   - **Other** specifies that this request is for general SAN resources not associated with specific hosts—perhaps to reserve space for a migration planned for a later date, but independent of hosts using the data. If you select this option, no other information is required to complete this request.
3. If you selected Hosts, click one of these buttons and select the hosts for this request:
   - **Add Existing** allows you to choose an existing host from a list of all of the hosts OnCommand Insight currently monitors.
   - **Add by App** allows you to choose an existing host by the applications that run on it.
   - **Add New** allows you to add a host that has not yet been brought online and monitored by OnCommand Insight.

Example

In this example, the Add by App option located four hosts that are currently running the selected application.



4. After selecting the targets, click **OK** to add the host information.

After you finish

If you specified host targets, click the **Requirements** tab to define your LUN and switch port requirements.

Defining storage request requirements

If you selected host targets for your capacity request, the requirements for those hosts must also be specified. You can specify required switch ports, the number of LUNs, the size of each LUN, and the level of service.

Before you begin

A storage request must be created with the target hosts specified.

Steps

1. To open add requirements through the OnCommand Insight Client, select **Planning > Requests**.
2. In the Requests list, right-click on the request to which you want to add requirements and select **Edit Request** or select **Action > Edit Request**.
3. Check the information in the request to be certain you are working with the request you wanted.
4. Click the **Requirements** tab and click the buttons to describe your hosts:
   - **Add LUNs** allows you to enter the number of LUNs you need and the size of each LUN in GB and to select the tier describing the level of service required. **Best practice**: In the Notes area, describe your LUN requirements to be certain the administrator understands your LUN requests. Click **OK** to save these selections in the request.

     Note: If you need LUNs with different requirements to fulfill the request, enter one LUN type in the fields and click **OK** to save it. Then click **Add LUNs** again to enter the other type of LUN. For example, you might need LUNs required in two tier types, so each tier has a separate entry in the request.

   - **Add Ports** allows you to enter the total number of ports you need for the LUNs you requested. **Best practice**: In the Notes area, describe how the ports should be assigned to the groups of LUNs requested. Click **OK** to save these selections in the request.
5. When you are satisfied with the descriptions of the requirements, click the **OK** to save the request.

   At this point, the Estimated Cost for each of your LUN and switch port requirements might be listed on the Edit Request window. If no costs are calculated and you want them to be, select **Tools > Settings** and the **Cost Accounting** option to enter the correct values.

After you finish

The storage administrator needs to research the best way to fulfill the request and reserve the necessary resources.

Submitting requests through the Web-based portal

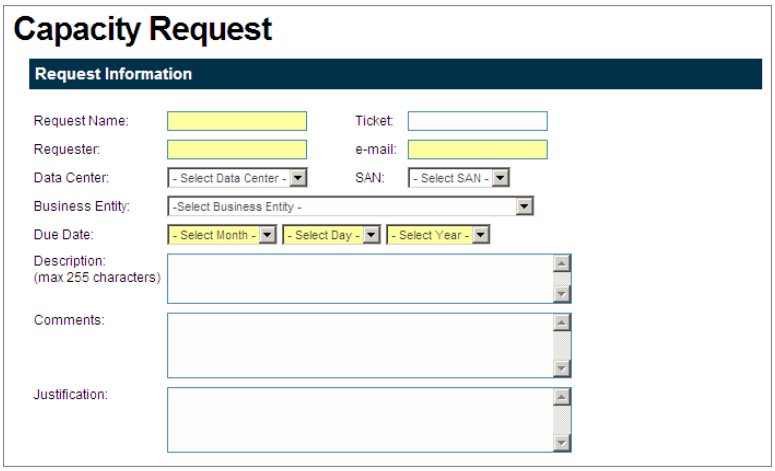
System administrators who are not using OnCommand Insight can submit capacity requests through the Web-based Request Portal to be managed in OnCommand Insight.

Steps

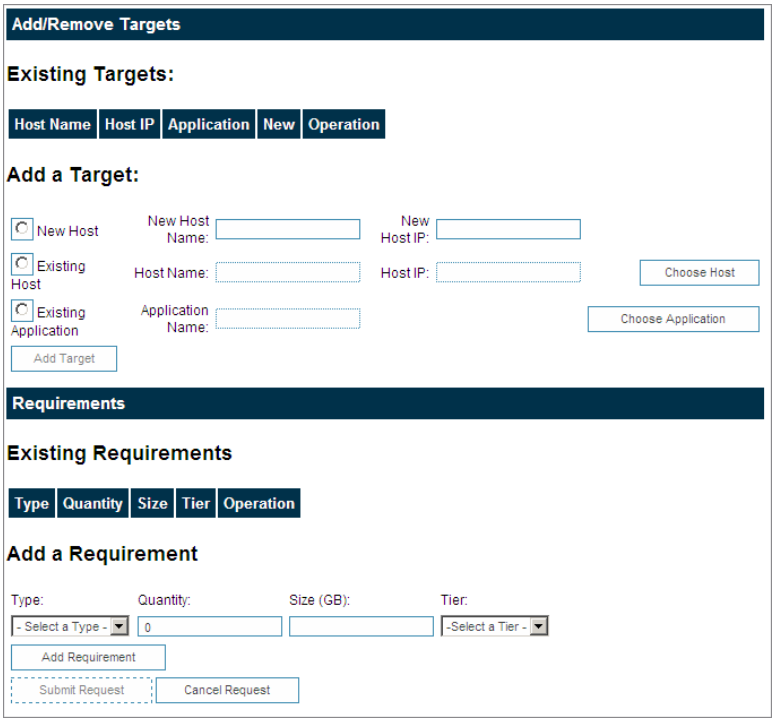
1. Log into the Request Portal using your OnCommand Insight host IP name in this URL:

`http://<hostName>/request-home/index.do`

2. Click the **Request Capacity** link to display the Capacity Request form, as shown here:



3. You must fill in these fields, highlighted in yellow, to create a valid request:
   - **Request Name** is the title of this request to make it easier to locate in the list of requests.
   - **Requester** is your name.
   - **e-mail** is your office e-mail address so that you can receive notifications about the request.
   - **Due Date** is the date when you must have this request fulfilled.
4. From this point, you can complete the request by entering host target and requirements at the bottom of the window. These selections have the same names and functions used to enter a request through the OnCommand Insight Client. See the "Selecting request targets" and "Defining storage request requirements" for specific instructions.



Note: You cannot edit an existing request through the Request Portal. If a revision or change is required, the requester needs to contact the administrator or use the OnCommand Insight Client.

After you finish

Because reservations cannot be entered using the Request Portal, the SAN administrator must make the reservations for your request using the OnCommand Insight Client.

Updating your Request Portal user name and password

If as the system administrator, you use both external Request Portal and the OnCommand Insight system to work on storage requests, and you changed your user name or password in the OnCommand Insight system User Management, you must manually change the same information in the Request Portal configuration file.

Steps

1. Navigate to the configuration file:

   ```
   <OnCommand Insight install dir>\conf\request-portal-default-config.xml
   ```

2. In the following section of the configuration file, change the username and password attributes to match what you entered in the OnCommand Insight User Management:

   ```
   <APIConnection>

   <Server name="localhost" host="https://localhost:443/
   OnCommandInsightapi" username="guest" password=" " />

   </APIConnection>
   ```

Reservations

Reservations allow you to manage the space allocations of various resources from multiple arrays or fabrics. The use of reservations prevents unavailable or inaccurate information from impacting the SAN, prevents service interruptions, and protects resources that were previously reserved.

Reservation requirements ensure that reservations are set properly. Reservations are checked against the reservation requirements to ensure there is no violation with the reservation. For example, if you set a reservation requirement of tier Gold on a volume of tier Silver, a violation would occur. If a reservation requirement is violated, the reservation must be deleted or edited.

Making storage reservations

The reservation process helps you to define the space allocation of different storage resources from multiple arrays or fabrics and prevents unavailable or inaccurate information from impacting the SAN. You can only make storage reservations through the OnCommand Insight Client.

Before you begin

In order to make resource reservations, you should check the capacity request to be certain it contains this information:

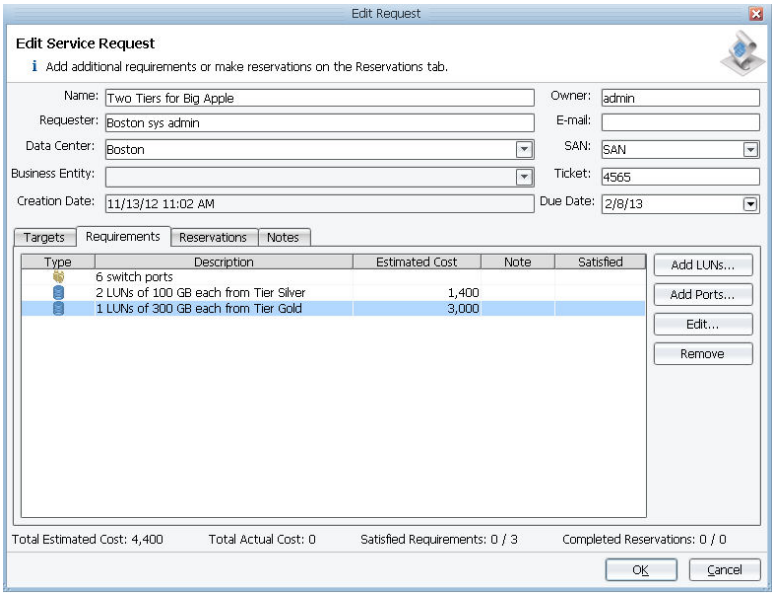
- Request description and due date.
- List of hosts to be used for this request.

- LUN and port requirements.

Steps

1. From the OnCommand Insight Client, select **Planning > Requests**.
2. In the **Requests** view, right-click the request to make reservations and select **Edit Request**.
3. If it is not already displayed, click the **Requirements** tab to see a summary of the request requirements.

   The requirements summary might include the estimated cost for the requests. In this example, the requester is asking for more capacity for two tiers.



4. Check the **Note** column for any additional information about the request.
5. Click the **Reservations** tab.
6. To begin reserving resources, highlight a LUN or switch port requirement and click **Add** to select the volumes, capacity, or ports options.

Result

OnCommand Insight lists all of the required physical tasks in the Pending Requests view. A check mark displays before the resources indicating which requirements have been satisfied. The Pending requests remain pending until they are physically implemented using native storage tools. OnCommand Insight updates pending requests as it detects the required changes during normal data collection.

Reserving a path to fulfill requirements

Based on automated recommendations, you can quickly select a volume and port to reserve storage arrays.

Before you begin

The Edit Reservations dialog box must be open and the request requirements entered.

Steps

1. Click the **Reservations** tab.
2. Select one of the requirements and click the **Add**.
3. Select the **Reserve Path** option and click **OK**.

   Based on your previous selections, the list of possible storage arrays opens and the lists of volumes and FC ports for those arrays open below.
4. Scroll through the list of storage arrays to locate recommended arrays. They are marked with a gold star in the first column.
5. Select a storage array and then select recommended volumes and FC ports below.
6. Click **OK**.

Reserving storage pools to fulfill requirements

Based on automated recommendations, you can quickly select a storage pool to reserve capacity.

Before you begin

The Edit Reservations dialog box must be open and the request requirements entered.

Steps

1. Click the **Reservations** tab.
2. Select one of the requirements and click the **Add**.
3. Select the **Reserve Capacity on Storage Pool (s)** option and click **OK**.

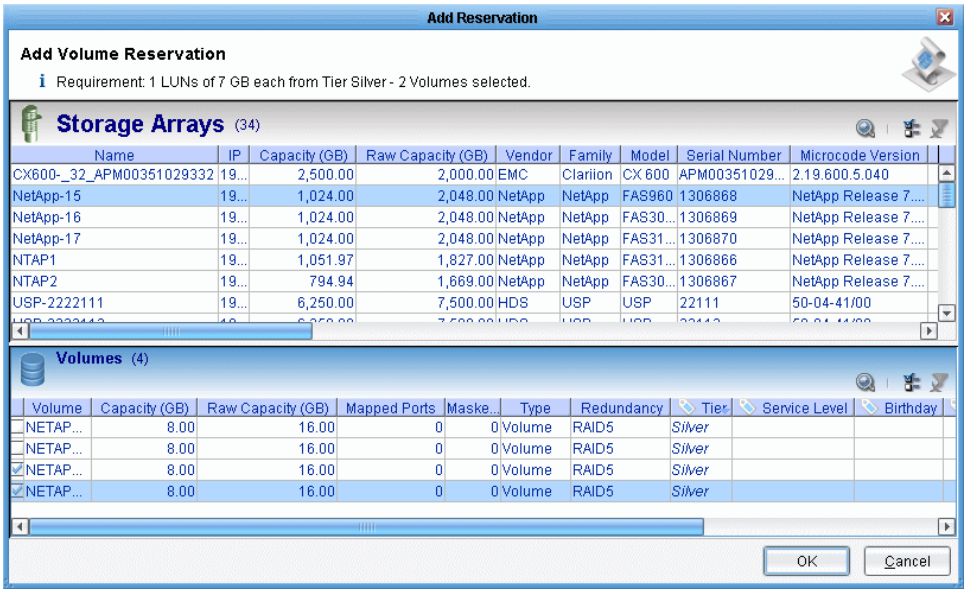
   Based on your previous selections, the list of possible storage arrays opens, and the lists of storage pools for those arrays open below that.
4. Scroll through the list of storage arrays to locate recommended arrays. They are marked with a gold star in the first column.
5. Select a storage array and then select one of the recommended storage pools below it.
6. Click **OK**.

Reserving volumes to fulfill requirements

You can reserve space from multiple arrays or fabrics to fulfill requirements. OnCommand Insight lists all of the available storage arrays in the environment and then removes reserved volumes from the list of available volumes.

Steps

1. In the **Reservations** section of the **Edit Request** window, select one of the LUN requirements and click **Add**.
2. Select the **New Volumes** option to show the available storage arrays and volumes. Both sections are shown in the **Add Reservation** dialog box.



3. Select a storage array that meets the location criteria of the requirement and examine the available volumes listed below. If no volumes are available for that array, no volumes are listed.

   Note: The requirement you are fulfilling is displayed at the top of the window.

4. Select a volume name check box to reserve it.
5. Click **OK** to save the reserved volumes.

Result

The reserved volumes are removed from the list.

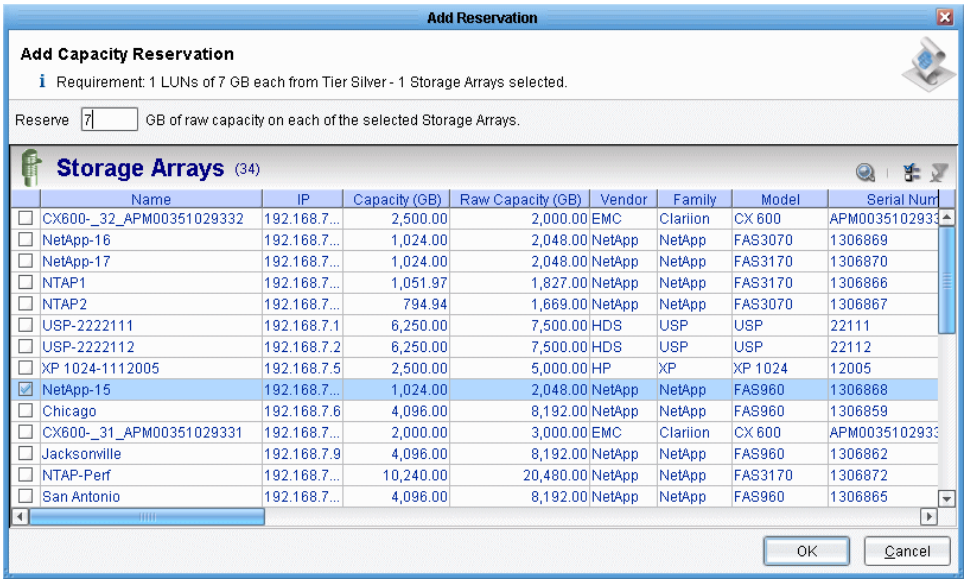
Fulfilling capacity requirements with general storage

If you want to reserve general storage capacity to fulfill a request requirement, you can select one or more appropriate LUNs from the list of storage arrays.

Steps

1. In the **Reservations** tab of the **Edit Request** window, select one of the LUN requirements and click **Add**.
2. Select the **New Capacity** option.
3. Examine the list of storage arrays to find a LUN with available capacity at the requested service level.
4. Select the check box next to the appropriate storage array and enter the number of GBs in the field at the top of the window.

   Note: The requirement is listed at the top of the window so that you know what is needed.



5. Click **OK** to save this reservation.

Adding general resources

If you want to add overall resources for a request, use the General Reservations to reserve volumes, capacity, or ports as part of the overall reservation description. For example, when you make requirements for the switch ports, you may need to set up an ISL.

Steps

1. From the OnCommand Insight Client, select **Planning** > **Requests**.
2. In the **Requests** view, right-click the request for which you want to make reservations and select **Edit Request**.
3. On the Reservations tab list, select the **General Reservations** item in the list and click **Add**.
4. Use any of these options to add overall resources to help fulfill this request:
   - **New Volume(s)** allocates specific free volumes for this request.
   - **New Capacity** allocates general capacity on storage for this request.
   - **New Port(s)** allocates switch ports for the LUNs selected with the New Volumes and New Capacity options.
5. Click **OK** on the **Add Reservation** dialog box and return to the **Edit Request** window.

Verifying requirements

After you have reserved LUN and port resources, you can verify that the requirements are satisfied.

Steps

1. In the Reservations tab, look at the **Satisfied** column beside the individual resource selections.
2. If a reserved resource satisfies a requirement, a green check is displayed in this column, as shown in this example. If the entire set of requirements is satisfied, a check is displayed for the request node at the top of the tree.

After you finish

Reservations that satisfy requirements might still create violations within the environment, so you must also check for violations and make any required corrections in your reservations.

Reserving switch ports

You need to fulfill the port requirements described in the request.

Before you begin

If you have requirements for more than one type of LUN, be certain that you know how many ports are to be assigned to each LUN type you reserve. That information was provided in the note attached to the port requirement.

Steps

1. Select the port requirement in the Reservations tab. Click **Add**.
2. Select the switch to be used and check off the specific FC ports displayed below the switches in a detail view.
3. Click **OK**.

   After the volumes and ports have been reserved successfully, the Reservations tab shows green arrows beside the requirements.
4. Check the Reservation Violations to be certain that the reservations have not violated any policies.

Reservation notes

You might want to add notes about the reservation decisions you made to fulfill a request. These notes help anyone checking the request to see the reservation progress.

In the Edit Request window, click the **Notes** tab and enter information in these areas:

- **Description** is a summary of information in the note.
- **Comments** usually explains the research behind the reservation decisions.
- **Justification** provides the reason for making reservations that might be contrary to the requester's choices. Some companies require all allocation decisions to include a justification.

Managing requests

Requests for capacity and ports remain in OnCommand Insight unless they are removed. You can edit requests, view all pending requests, check violations on them, and cancel requests. With the history of capacity requests, you can project future allocation and identify a time when you will run out of storage for a specific tier or data center.

You can do the following tasks related to managing requests:

- Check the status of the request.
- Identify any violations related to the request and correct them.
- Verify whether the request has been fulfilled and the physical changes have been made in your storage environment and mark the request as completed.
- Project future allocation based on the history of capacity requests and estimate when you will run out of storage.
- Cancel a request.
- Remove the request from the system.

Checking the status of pending requests

You can check the status of incomplete requests using the Pending Tasks view. You might want to do this to see if changes were made to the physical setup of the equipment at the data center. After changes occur to the physical setup of the equipment, OnCommand Insight updates pending requests as it detects the required changes during normal data collection. Then, the request is complete and no longer appears in the Pending Tasks view.

Before you begin

The request must have been created and storage resources must have been reserved using the OnCommand Insight Requests and Reservations options (either in the Client or in the Request Portal).

About this task

Reservations are complete when there is a corresponding change to the physical setup of the equipment at the data center. After the physical setup of the disk shelves and storage systems occurs, the reservation is complete and disappears from the Pending Tasks view.

Steps

1. From the OnCommand Insight Client, select **Planning > Pending Tasks**.

   All pending reservations appear.

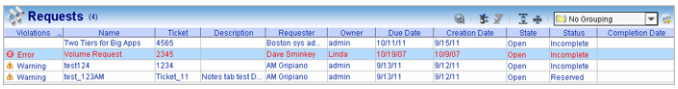
2. In the **Pending Tasks** view, sort the requests either by Request Ticket or Requester to see your requests.

Checking violations and making corrections

If there are issues with a request, if it is overdue, or if it violates specific policies, OnCommand Insight displays those violations. For example, if a device is over-utilized, scheduled to come off lease, or subject to a tier conflict, OnCommand Insight detects these violations. You can look at the violations and determine the next course of action.

Steps

1. From the OnCommand Insight Client, select **Planning** > **Requests**.



2. In the **Reservations** detail view, select the request.
3. To view all of the reservations associated with a request, click the Reservations icon on the icon toolbar below the detail views.

   The Reservations detail view shows the reservations associated with the request.
4. Click the Reservation Violations icon on the icon toolbar.

   The Reservations Violations detail view displays the violations associated with the request.

5. Do one of the following:
   - If there are reservation violations, return to the Reservations tab, delete the reservations on the ports or volumes, and select different ports or volumes for the reservation.
   - If there are request overdue violations, check on the fulfillment of the reservation to ensure that the change has occurred to the physical equipment.
   - If there is a tier conflict, edit the request to select a resource that matches the tier requested.
   - If a device is over-utilized or scheduled to come off of its lease, edit the request to select another resource.

Verifying fulfillment of requests for storage resources or ports

After you enter a request and reserve storage resources or ports, you can verify that requests have been fulfilled in your storage environment. You might want to do this to complete the cycle of requests, requirements, and reservations.

About this task

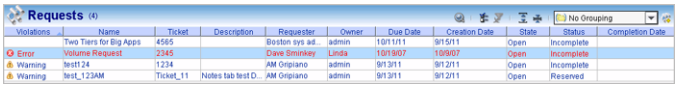
After changes occur to the physical setup of the equipment, OnCommand Insight updates pending requests as it detects the required changes during normal data collection. Then, the request is complete and no longer appears in the Pending Tasks view. In the Requests view, the Status field automatically changes from Reserved to Allocated.

After the physical changes have been made and you have verified them, you should change the Request State to Complete.

Steps

1. From the OnCommand Insight Client, select **Planning** > **Requests**.

   At this point all configurations have been set and storage is available to the host. OnCommand Insight obtains this information during its regular data collection process.



2. In the **Requests** view, select the request and verify that the Request Status shows "Allocated."
3. In the **Requests** view, change the Request State to Completed by doing the following:
   a. Right-click on the request.
   b. Select **Set Request State** > **Completed**.
4. To view all of the reservations associated with a request, click the Reservations icon.

   The Reservations detail view shows the reservations associated with the request.

Projecting future allocation needs

The Storage Capacity Planning by Timeframe report projects the future allocation needs based on the history of your past capacity requests. Using this report, you can identify an estimated time when you will run out of storage for a specific tier and data center.

About this task

You can make requests for system resources and later you can fulfill these requests by submitting a reservation for those resources. The status and validity of requests is recorded using these designations:

- New
- Not Yet Reserved
- Reserved
- Canceled
- Rejected

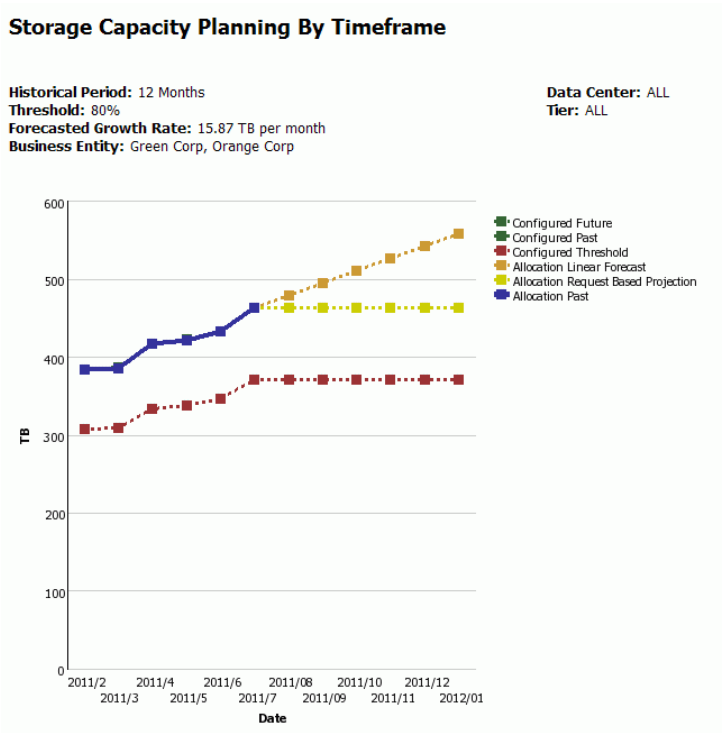
OnCommand Insight tracks these requests as they proceed from initial submission to selection of the desired resources, and finally to the successful allocation of those resources.

Steps

1. Access the Reporting Portal.
2. Do one of the following:
   - Select the **Detailed Reports** tab. Scroll to the Capacity Storage Reports section. You might need to go to the additional pages to see more reports.

- Select the **Public Folders** tab. Click the **Storage Capacity** link. Click the **Dashboards** link. Select the **Capacity Storage Reports** folder. Click the **Storage Capacity Planning by Timeframe** link.

Sample report



Cancelling a request

You can cancel requests even after they have been reserved. Canceling a request will de-allocate reserved storage or ports. If a request was partially or fully implemented or reserved and resources are no longer needed, cancelling can prevent orphan capacity reservations.

About this task

If you receive a message to cancel a request that has already been allocated because the resources are no longer needed, you can de-allocate the reservation. If you cancel the request, changes must be made to the physical equipment as well, which is done external to OnCommand Insight.

If you cancel a request and subsequently re-open it, the Request State changes to Open.

Steps

1. From the OnCommand Insight Client, select **Planning > Requests**.
2. In the Requests view, right-click on a request and select **Create Request > Set Request State > Cancelled** or from the Action menu, select **Set Request State > Cancelled**.

   The Requests view displays Cancelled in the State column.
3. In the Status bar, click the Reservations Violation icon.

4. In the **Reservations Violations** detail view, note any allocated resources on the cancelled request. Do one of the following:
   - If no reservations have been allocated, consider the request successfully cancelled.
   - If reservations have been allocated, edit the reservation and remove the assigned resources.

   Note: If you want to delete a request completely, follow the "Removing a request from the system" steps.

Removing requests from the system

Typically, requests for capacity or switch ports remain in the system. Information about these requests are used in reports. However, you might need to remove a request. If you remove a request, all reserved resources are also removed and are now available for others to use.

Before you begin

The request must already have been cancelled and "Cancelled" must appear in the State column on the Requests view.

Steps

1. From the OnCommand Insight Client, select **Planning** > **Requests**.
2. In the Requests view, right-click on a request and select **Remove Request** or from the Action menu, select **Remove Request**.
3. In the confirmation message, click **Yes**.

Requests reference

This section describes the views displaying data relating to capacity requests.

Pending Tasks view

After a request is entered and the resources are reserved, the physical tasks associated with the request are listed in the Pending Task view. OnCommand Insight updates pending requests as it detects the required changes during normal data collection.

Navigation

From the OnCommand Insight Open menu, select **Planning > Pending Tasks**.

Column descriptions

If a task is shown in red in this view, there is a violation associated with it.

Task

Indicates the action required such as Allocate.

Type

Indicates what resource is being acted upon such as a Port or Volume.

Description

System identifier of the resource to be used to locate it for the physical change that is required in the task.

Request

Title of this request defined by the requester.

Request Ticket

Identifying code defined by your company to be used to track capacity requests.

Request Target

Indicates the type of resource for which the request is made such as a Host.

Requester

Name or job title of the person submitting this request.

Owner

Name or job title of the person responsible for fulfilling this request.

Due Date

Date by which the request needs to be fulfilled.

Requests view

The Requests view lists all of the active capacity requests being processed and completed or cancelled requests displayed for a set length of time. To view all of the reservations associated with a request, select the request in this list and click the Reservations icon.

Navigation

From the OnCommand Insight Open menu, select **Planning > Requests**.

Column descriptions

Click the icon in the upper right corner of this view to list only the New and Open requests.

Violations

Warnings that resources selected to fulfill a request are not the best choice in the environment.

Name

Title of this request defined by the requester.

Ticket

Identifying code defined by your company to be used to track capacity requests.

Description

Information the requester entered to describe the request in more detail.

Requester

Name or job title of the person submitting this request.

Owner

Name or job title of the person responsible for fulfilling this request.

Due Date

Date by which the request needs to be fulfilled.

Creation Date

Date that the request was submitted.

State

Indicates the administrative condition of the request as Open, Rejected, Cancelled, or Complete. You must manually change the state from Open to one of the other states using the Set Request State option on the right-click menu.

Status

Indicates if the reservations were made for the requirements. If all of the requirements are fulfilled with reservations, the status of the request is "Reserved." If no reservations or too few reservations to fulfill the requirements were made, the status of the request is "Incomplete." The status changes automatically from Reserved to Allocated when the reservations are implemented in the physical equipment.

Completion Date

Indicates when data collection identified that the request was physically fulfilled.

Reservations view

To display the reservations for a specific request, you can examine the Reservations tab in the request or use the Reservations view.

Navigation

From the OnCommand Insight Open menu, select **Planning > Requests**. Select a request in the Requests view and click the **Reservations** icon to display the list of reservations for that request.

Column description

Complete

Displays a check mark to indicate that the reservation is complete. Reservations are complete when there is a corresponding physical setup of the equipment at the data center.

Type

Indicate whether the reservation is for a Port or a Volume.

Description

Specifies the port or volume that was selected for the reservation.

Creation Date

Date that the request was submitted.

Reservation Violations view

From the Reservation Violations view, the storage administrator investigates the different reservation-related violations, identifies the problems, and makes corrections using the Planning features.

Navigation

From the OnCommand Insight Open menu, select **Assurance > Reservation Violations**.

Column descriptions

blank

Applicable with any presentation order other than No Grouping. Column that organizes the data according to the selected grouping format.

Violation

Indicates the type of violation on the reservation. It can be Error, Warning, or Info.

Type

Identifies the resource problem generating the violation of the reservation.

Details

Additional information about the resource problem.

Request

Name of the resource reservation entered on the ticket.

Request Ticket

Code identifying the request in the system.

Device Type

The system element that has caused the request violation.

Device

Description of the system element that has caused the request violation.

Since

When the violation was identified.

annotations

User-defined terminology associated with the reservation violations including Violation Severity and Note.

Task planning

OnCommand Insight Plan helps you create plans to implement changes in your Fibre Channel environment including consolidation and migration projects.

SAN change-management, when performed in the production environment, is a major contributor to application downtime (planned and unplanned). Change-management processes require validation to assure application availability and to maintain a validated SAN at all times.

Using the OnCommand Insight Plan planning capabilities, you can minimize application downtime. You can simulate your plan to understand its effect on your service-level policies and validate planned changes before executing your plan.

When a plan is implemented, OnCommand Insight checks the storage environment to find completed tasks and note any incorrectly implemented tasks.

Creating a change plan

A change plan comprises a step-by-step set of distinct tasks to manage complex changes in your Fibre Channel environment. Each change plan includes a series of ordered tasks required to complete the project. Each task provides a work order for an employee to perform a specific SAN change.

Before you begin

To prepare for a new project, assemble a list of all of the changes needed for the operation. You might want to record them in an Excel spreadsheet.

Steps

1. Create the change plan using the OnCommand Insight templates, imported tasks from Excel, or adding individual tasks.

   Note: The templates provide a convenient way to define the repetitive tasks required to add storage to a host or to decommission a host.

2. To assist the network and storage engineers performing the tasks, you might add examples to illustrate specific operations.
3. Use OnCommand Insight to pre-validate each task in the plan.
4. Change the plan **State** from **Planning** to **Implementation**.

   This action switches on the OnCommand Insight tracking mechanism.

5. Generate task-validation reports and distribute them by email or as a hard copy to the network and storage engineers, who are going to perform the tasks.

   The engineers make the necessary changes using the vendor-specific tools available for your SAN.

6. Check OnCommand Insight for the status of the tasks in the plan. (OnCommand Insight automatically checks your environment for changes listed in the plan and notes whether they were completed or performed incorrectly.)
7. Locate any deviations from the plan and resolve them.
8. Discover any violations and then investigate and resolve them.

9. When all of the tasks have been successfully completed, change the plan **State** from **Implementation** to **Completed**.

Starting a plan

You might use any of these methods to start a change plan for your Fibre Channel environment.

About this task

- Using a OnCommand Insight template to create a predefined plan for adding storage to host or decommissioning a host.
- Importing task definitions from an Excel spreadsheet.
- Add an individual task as the starting point.

Steps

1. From the OnCommand Insight **Open** menu, select **Planning > Plans** and do not select any of the existing plans.
2. In an empty area of the Task list main view, right click and select **Templates** and one of the two predefined plans for adding storage to host or decommissioning a host or select **Add Tasks From Excel** and select the file to import or select **Task > Add task**.

Importing tasks from a spreadsheet

You might want to import tasks into the OnCommand Insight plan from a spreadsheet. This is useful to manage mass migrations. For example, if you add many new hosts weekly, the Excel-formatted table allows you to import a list of corresponding tasks quickly.

Before you begin

Create an Excel spreadsheet listing specific tasks for a plan.

Steps

1. From the OnCommand Insight **Open** menu, select **Planning > Plans**.
2. To initiate the task import from a spreadsheet, right click on the Task list and select **Add Tasks From Excel**.
3. Select the spreadsheet to import and click **Open**.

   OnCommand Insight imports the task data, following these rules:

   - Create a new task for each task that was not previously imported using the same Reference ID (from a file with the same B1-B3 file-identifying data).
   - Include in the same task all rows with the same reference number.

   The import then generates the following action(s) for each new task, as appropriate:

   - Add Host
   - Add Hosts to Application
   - Add HBA to Host
   - Add Volume
   - Add Volume Map

- Add Volume Mask
- Add Zone
- Add Zone Member
- Connect Ports
- Authorize Path

4. In the event of an error (that is, a violation of one or more field constraints), OnCommand Insight generates a report.

   Each line in the report identifies the exact row in the spreadsheet that caused the violation. No single error stops the validation process, so the error report provides a complete list of errors for the file.

Guidelines for importing tasks

You can import tasks from a Microsoft Office Excel spreadsheet to have OnCommand Insight generate tasks and actions based on them.

Each task must relate to a single host device and a single storage device (but the storage can have multiple volumes). All lines with the same Ref number relate to the same task.

You can import the following types of tasks or operations:

- Add Host
  Adds a new host, and then adds a path from that host to disk storage. The task name is generated as Add new host *`host-name`*(*`host IP`*) to *`Storage storage-name`*.
- Add Storage to Host
  Adds a new path from an existing host to disk storage. The task name is generated as Add storage *`storage-name`* to host *`host-name`*(*`host IP`*).
- Add Tape
  Adds a new path from an existing host to tape storage. The task name is generated as Add Tape *`storage-name`* to host *`host-name`*(*`host IP`*)
- Host Decommission
  Decommissions a host from the SAN.

The switches and storage devices referenced by the task must exist before tasks can be imported from a spreadsheet; however, the Add Host and Add Storage to Host operations can add new volumes.

Spreadsheet format required for importing tasks

When you import a spreadsheet file, it must contain certain fields in B1, B2, and B3, respectively. These fields serve to identify the file, and must be unique across all task-import files.

- Date, in *mm*/*dd*/*yy* format (09/30/10)
- Time, in *hh*:*mm* am/pm format (09:50 am)
- Name of the submitter (free-form text)

The rest of the file contains one line for each task or action being added or updated, as follows. Fields are listed below moving left to right, starting with column A. All fields are required unless otherwise noted below:

Field	Description

Ref	Reference number for the task/project as it appears in the change ticketing/help desk system, or any other number that identifies the change. Note: When the Ref number displays in the main Task list, it shows up as the concatenation of this value plus the task's *objid*. Use the same reference number on all rows (actions) that apply for the same task. All lines with the same Ref value relate to a single host and storage device.
By	Name of the person in charge of completing the task. Include only in the first line for the task (that is, with the first line that includes the task Ref number).
Ticket#	Optional. Number of the task/project as it appears in the change ticketing/help desk system or any other number that identifies the change.
Operation	One of the following to identify the task action: • Add Host • Add Storage to Host • Add Tape • Host Decommission For this type of operation, the only required fields (in addition to the identifying information, Ref , By and Ticket#) are the Host Name and Host IP. All other fields are ignored.
Host Name	Target host for the task, identified by name. Must be the same for all lines having the same Ref number, or must appear in only the first line for a particular Ref.
Host IP	Target host for the task, identified by IP address. Must be the same for all lines having the same Ref number, or must appear in only the first line for a particular Ref.
Adapter	World Wide Name for the HBA adapter.
HBA WWPN	World Wide Port Name of the HBA adapter. Must comply with one of these WWN formats: • hh : hh : hh : hh : hh : hh : hh : hh • hh hh hh hh hh hh hh hh • hhhhhhhhhhhhhhhh Where *h* is a single (case-insensitive) hexadecimal digit.
HBA Switch	Name or WWN to identify an existing switch that's connected (or will connect) to the HBA.
HBA Port	Switch port that is connected (or will connect) to the HBA port, formatted as: < *unique switch name* >/< *port number* > Where the < *unique switch name* > provides enough characters to uniquely identify the switch port. For example: R1-FabricA-shelf1/21 The referenced switch port must exist already in the SAN. If the identifier is not unique, the row will be excluded and an error message generated.
Fabric	Optional. Fabric/VSAN where the HBA and storage port are connected (must exist already in the SAN).
Storage/ Frame	Optional. Name of the existing storage device (only one per Ref number). You must provide either the entire name, or enough of the name to uniquely identify the storage device. If the name is not unique (so equally identifies two or more storage devices), the row is excluded and an error message generated.

Storage ID	ID of the existing storage device (for example, Symmetrix serial number). You may specify only one storage ID per Ref number.
FA	specific device created for a customer Optional. Name of the existing FA for the path. Must exist already in the SAN.
FA WWN	WWN of the existing FA port (that is, storage controller).
FA SW	Name or WWN to identify an existing switch that's connected (or will connect) to the storage port.
FA Port	Number of the existing switch port that's connected (or will connect) to the storage port, formatted as: < *unique switch name* >/< *port number* > Where the < *unique switch name* > provides enough characters to uniquely identify the switch port. The referenced switch port must exist already in the SAN. If the identifier is not unique, the row will be excluded and an error message generated.
Zone Name	Name of the zone for the HBA and storage port.
Volumes	Comma-separated list of volumes in the path (ALL for a simple disk device or a tape). Do not include ranges (that is, use 00a, 00b, 00c, 00d instead of 00a..00d). Must be the same for all lines having the same Ref number, or must appear in only the first line for a particular Ref.
Application	Applicable when the host is assigned to one or more applications. Application(s) with which the host is associated (required when you specify the Volume Sharing).
Redundancy	Desired redundancy level for the new path (Dual Fabric or DF), No SPF (or NS), or None).
Host Ports	Optional. Maximum number of host ports that can access the storage (tape device or volume referenced by the task). Include only in the first line for the task (that is, with the first line that includes the task Ref number).
Switch Hops	Maximum number of switch devices the new path should traverses from host to storage. Include only in the first line for the task (that is, with the first line that includes the task Ref number).
Volume Sharing	Optional. Level of volume sharing permitted by the host, as specified by the policy (Any , No Sharing, or Application). If you specify this field, you must specify the Application field as well.
Start Date	Starting date for the task, specified in a field defined as having a Date format in the spreadsheet. Include only in the first line for the task (that is, with the first line that includes the task Ref number).
Start Time	Starting time for the task, specified in a field defined as having a Time format in the spreadsheet. Include only in the first line for the task (that is, with the first line that includes the task Ref number).
End Date	Ending date for the task, formatted as described for the Start Date, above. Include only in the first line for the task (that is, with the first line that includes the task Ref number).
End Time	Ending time for the task, formatted as described for the Start Time, above. Include only in the first line for the task (that is, with the first line that includes the task Ref number).
Comments	Optional. Text field, available for free-form comments. Include only in the first line for the task (that is, with the first line that includes the task Ref number).

Updating tasks in a spreadsheet

An imported spreadsheet task file can be used to update or delete task data.

Steps

1. To update tasks, modify the spreadsheet that was originally used to add tasks.
2. Import that spreadsheet again to update the changed tasks.

   Note: Be certain that the identifying information in fields B1 - B3 are identical to the information in the original file.

   This method can also be used to delete task data by removing the task data and re-importing the spreadsheet.

After you finish

OnCommand Insight imports the changed task data using the following rules:

- Delete tasks that were previously imported from a file with the same B1-B3 file-identifying data, but that are missing from the current file.
- Modify (meaning, redefine) tasks that were previously imported from a file with the same B1-B3 file-identifying data, and that are also included in the current file.
- Include in the same task all rows with the same reference number.

Adding tasks

Each plan is composed of one or more tasks, which are in turn each composed of one or more actions. If you want to create a task in an existing plan, select the plan in the Task List and use the Add Task option.

About this task

The Task List displays your defined plans, in the order in which they were specified.

Steps

1. From the OnCommand Insight **Open** menu, select **Planning > Plans**.

   The Task List main view opens.
2. To add the task to an existing plan, select that plan in the list.
3. Right click and select **Task > Add task**.
4. Define the task including a specific task name, any dependency, and the start and end dates.
5. Click **OK**.

   The task becomes part of the selected plan. If you need to edit or delete it, select the appropriate option from the Task menu.

Pre-validating tasks

Pre-validating the plan tasks allows you to predict the violations that will be generated upon completion of the task or to identify conflicts with other tasks related to volume allocations.

Steps

1. Use the drop-down menu to pre-validate the integrity of the task manually. With the task selected, right-click **Validate Task**.

   OnCommand Insight pre-validates the task and refreshes the Plans view. The first indication of the validation status is visible through the color of the corresponding row in the Task List: Review the Pre-Validation column in the Task List to see the validation results: Failed indicates a failure and Passed indicates a successful task validation.

   - Red indicates that if the task were performed, new violations would be introduced to the SAN.
   - Blue indicates that implementation of the task would not result in a new violation.

2. Use the **Future Violations** detail view to review future task violations. As necessary, analyze these violations using the Analyze Violation tool from the right-click menu. This tool only works on a single path, so expand (+) the Future Violations list to display each path you want to analyze.
3. Use the **Errors** detail view to look for action-related errors. Each error listed has an identifying action number to the left, which ties it to the Actions-list step number (#).
4. Use the **Future Changes** detail view to review actions that have not yet been implemented, including future violations those actions will create.
5. Generate a Task Pre-Validation report and share the URL with other OnCommand Insight users to share the task, actions, and completion status with those users.

Adding actions to the plan

The available action types are predefined, and each type of action requires that specific data be supplied in order that OnCommand Insight can pre-validate the effects of the action on your existing SAN.

About this task

For example, when the action requires the addition of a storage controller, you need to provide the number of ports on the new controller, its name, and the name, and IP address of the storage device where it will be installed.

To add predefined actions to tasks, follow these steps:

Steps

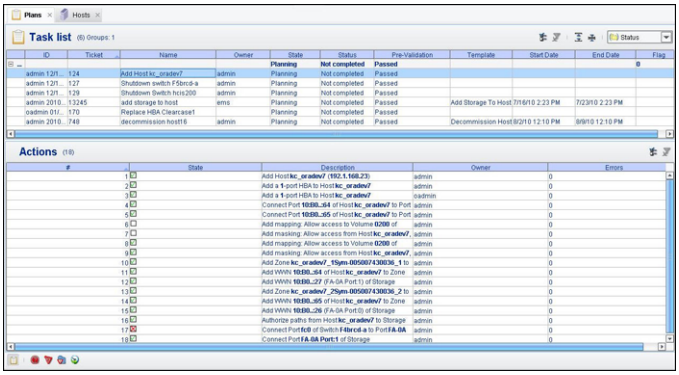
1. From the OnCommand Insight **Open** menu, select **Planning > Plans**.
2. Select a plan in the list.
3. Click the **Task Actions** icon to display the Action detail view.
4. Position your cursor in the empty area of the Action detail view and right click.
5. Select **Add action** and select one of the predefined actions from the pull-down menu.

   Each action type includes features to implement the action easily in the plan.

   - Parameters - used to configure the action including variables.

- Validating - information on how OnCommand Insight tracks the action.
- Prerequisites - requirements that must be fulfilled before the action can be evaluated during task pre-validation.
- Implicit actions - additional activities that occur when the action is include in a plan.

This example shows the Task List with the Task Action detail view below.



Action types in plans

Tasks can include different types of actions.

Each action type includes features to implement the action easily in the plan. Each device entered into the action parameters must be defined in OnCommand Insight, either as part of the SAN environment, previously in the current task, or in a task that is executed before the current task (that is, a task on which the current task depends).

Action Type	Description
Add Controller to Storage	Add a new port controller to an existing storage array with these parameters: • # of Ports - Number of ports on the controller. Click **Add** once for each port, and then specify the WWN for that port. Click Remove to delete a selected port. • Controller - World Wide Name (WWN) for the controller. • Storage name (IP) - Storage array for which you are adding the controller, identified by name and IP address. Select the device from the list of available devices. If the controller was removed and is now being added (all in the same task), this action restores the controller's ports, port connectivity, volumes, and volume mapping/masking.

Add Controller to Tape	Add a new controller to an existing tape device with these parameters: • # of Ports - Number of ports on the controller. Click **Add** once for each port, then specify the WWN for that port. Click Remove to delete a selected port. • Controller - World Wide Name (WWN) for the controller. • Tape name (IP) - Tape device for which you are adding the controller, identified by name and IP address. Select the device from the list of available devices. If the controller was removed and is now being added (all in the same task), this action restores the controller's ports and port connectivity.
Add HBA to Host	Add a new host bus adapter (HBA) to an existing host with these parameters: • # of Ports - Number of ports on the HBA. Click **Add** once for each port, then specify the WWN for that port. Click Remove to delete a selected port. • HBA Adapter -World Wide Name (WWN) for the HBA adapter. • Host name - Host where you are adding the HBA, identified by name and IP address. Select the host device from the list of available devices. If the HBA was removed and is now being added (all in the same task), this action restores the host's ports, port connectivity, volumes, and volume mapping/masking.
Add Host	Add a new host using this parameter: • Host name (IP) - Name and IP address to identify the host. You'll be prompted to enter these values separately. If the host was removed and is now being added (all in the same task), this action restores all the host's ports, port connectivity, volumes, and volume mapping/masking.
Add Hosts to Application	Adds one or more selected hosts to an application group, optionally defining a new application group for this purpose with these parameters: • Hosts - Name to identify the hosts being added. Select one or more hosts from the list of available hosts. • Application - Application to which the selected hosts should be assigned. Choose an existing application from the drop-down list, or enter a name to define a new application.
Add Ports to VSAN	Add one or more ports on a Cisco switch to a virtual SAN (VSAN) with these parameters: • # of ports - Number of switch ports being added to the VSAN. Select one or more ports from the list of available switch ports. • Switch name - Name of the switch whose ports are being added (filled in automatically after you select the ports, above). • VSAN - VSAN to which you are adding the new ports. Select a VSAN from the list of fabric/VSANs.

Add Storage	Add a new storage array using this parameter: • Storage name (IP) - Name and IP address to identify the array. If the storage array was removed and is now being added (all in the same task), this action restores all the device's ports, port connectivity, volumes, and volume mapping/masking.
Add Switch	Add a new switch. If you plan to generate blade/ports (for switch cards), specify the switch parameter first because this information is required for port generation. If you plan to generate blade/ports (for switch cards), specify the Switch parameter first, because this information is required for port generation. You can use these parameters: • # of ports - Number of blades/ports on the switch. Click the appropriate tab to identify the switch ports individually. Blades (to add switch cards) - click **Add** once for each blade on the switch and then fill in the unique numeric blade number and the number of ports per blade. Ports - click **Add** once for each port on the switch and then fill in the WWN to identify each port. If you identified the switch already, OnCommand Insight pre-fills each port WWN with the WWN of the switch, followed by a dash and a port number. Click **Generate** to automatically add the ports for each blade. OnCommand Insight calculates the ports based on the switch WWN and blade numbers, assigning each blade port a unique WWN. **Note:** You must enter the switch name and WWN before generating ports. • Switch - Name and WWN to identify the switch being added and an indication of whether the switch is VSAN-enabled. If enabled (checked), the policy is determined by the VSAN, and you can add switches (Add VSAN action) then switch ports (Add Ports to VSAN action). Once you have a VSAN-enabled switch you can add VSANs to it. Each VSAN can be added to one or more switches. Then you can add ports to the VSAN (on those switches). Each group of VSANs with the same WWN and name merge to create one fabric. This serves as a mean of isolation. Switch devices that do not support VSAN have one large fabric for all of the ports. • Policy - Applicable only if the switch is not VSAN-enabled. Policy settings that apply for the switch (for example, Domain ID and Priority).
Add Tape	Add a new tape device using this parameter: • Tape name (IP) - Name and IP address to identify the tape device. If the tape device was removed and is now being added (all in the same task), this action restores the device's previous connectivity.
Add Volume	Add a new volume to a storage array with these parameters: • Volumes - Volumes to be added. Click **Add** once for each volume, then specify the volume name. Click **Remove** to delete a selected volume. • Storage name - Name of the storage array for which you are adding volumes. Select the device from the list of available devices.

Add Volume Map	Add mapping between a volume and a disk storage port with these parameters: • Volume - Name of the volume for which you are adding mapping. Select a volume from the list of available volumes. The drop-down list includes the status of each volume. This helps to better understand if this is the right volume (that is, whether this volume is masked and/or reserved by other tasks). • Storage name - Storage array where the volume is defined (filled in automatically after you select a volume, above). • Port - Port, on the storage array, to which the volume is mapped. Select a port from the list of available ports on the selected volume. • LUN - Logical Unit Number used by the host to access this volume.
Add Volume Mask	Add masking between a volume (disk storage port) and a host with these parameters: • Initiator (and WWN) - Host port or adapter (node) to which the storage volume is masked. Select an Adapter or Port from the list of available adapters/ports. Both are identified by WWN in the list of available ports for each host. The host name is filled in automatically after you select an adapter/port. • Volumes - Name of the volumes to be masked to the host adapter or port identified above. The drop-down list includes the status of each volume, as detailed below, as well as an icon that is appropriate to that status (for example, masked or available). This indicates if this is the right volume (that is, whether this volume is masked and/or reserved by other tasks). *no text* (available volume) - The volume is not masked, either by the current SAN configuration, or by a planned action. Already Masked - The volume is masked (that is, in use by the current SAN configuration), as noted by the text that follows the status. Reserved - The volume is masked by another action or task in the plan, as noted by the text that follows the status. Already Masked and Reserved - The volume is masked in the current SAN configuration, and the volume is reserved by at least one other action or task (as noted by the text that follows the status). • Storage name - Storage array where the volume is defined (filled in automatically after you select a volume). • Port - Name of the storage port (on the named array) from which the volume is accessible to the host initiator.

Add VSAN	Allocate one or more VSAN-enabled switch devices to a new or existing VSAN with these parameters: • VSAN - Indication of whether the VSAN is new. Mark the New or Existing check box. If new, enter an ID between 1 and 4094, and a unique VSAN name. If existing, select the VSAN from the list of available VSANs. • Switches - Switch(es) that will be a part of this VSAN. Choose one or more switches from the list of available switches. • Policy - VSAN policy settings (Domain ID, Priority, Merge Control, and so forth). Refer to your VSAN documentation for detailed information about these settings, as necessary. If you select more than one switch, this field is always "default policy." This action creates the VSAN and/or fabric if it does not exist already.
Add Zone	Add a new zone to a fabric with these parameters: • Zone name - Unique name to identify the zone. • Fabric/VSAN - Fabric/VSAN where you are adding the zone. Check this definition against the zoning configuration information received from the switch. The fabric to which the zone is added must be defined in OnCommand Insight as part of the SAN environment. If the zone was removed and is now being added (all in the same task), this action restores its members.
Add Zone Member (by Switch Port)	Add a particular switch port to a zone with these parameters: • Port - Port to add to the zone. Select a port from the list of available switch ports. • Switch - Name of the switch whose port is being added (filled in automatically after you select a port). • Zone - Zone where you are adding the new member. Select a zone from the list of available zones. • Fabric/VSAN - Name of the fabric/VSAN where the selected zone is configured (filled in automatically after you select a zone).
Add Zone Member (by WWN)	Add a new zone member, identified by World Wide Name (WWN) with these parameters: • WWN - WWN to identify the member being added to the zone. Select a member from the list displayed when you click this parameter - a host adapter port, switch port, and generic device port. • Device - Device type and name (filled in automatically after you select the zone member). • Zone - Zone where the new member will be added. Select a zone from the list of available zones. • Fabric/VSAN - Name of the fabric/VSAN where the selected zone is configured (filled in automatically after you select a zone).

Authorize Path	Set policy for one or more paths. Defines a host policy for one or more paths that connect a specific host server and its data residing on a storage device (disk volume or tape). You can use these parameters: • Host - Name of the host for the policy. Select a host from the list of available servers. • Storage name (IP) - Name of the storage device where the data for this path resides. For a disk array, select one or more volumes. • Attributes for the new host policy- Attributes for the new host policy.
Connect Port	Verifies that some (any) device is connected to a particular device port. This action is useful when you plan to connect a particular switch port to a port WWN, but that port WWN is currently unknown. With the action in place, you can track the State check-boxes (Ports detail pane) to see when the connection is actually made. You can use these parameters: • Port - Name of the port to check for a connection. • Device - Name of the device where the port is defined (filled in automatically after you select a port).
Connect Ports	Connect two ports using these parameters: • Port 1 and Port 2 - Ports that you want to connect. • Device - Name of the device where each port is defined (filled in automatically after you select each port).
Disconnect Ports	Disconnect two ports using these parameters: • Port 1 and Port 2 - Ports that you want to disconnect. The second (connected) port displays automatically after you select the first port. • Device - Name of the device where each port is defined (filled in automatically for both ports, after you select the first port).
Edit Authorized Path	Edits the host policy for one or more paths use these parameters: • Update authorized path - Click the **no paths selected** link to view the table of currently authorized paths and scroll through the list to select the path you want to edit. • None redundancy - Click to view the policy parameters that can be changed, and then select the new policy attributes for the path.
Enable zone configuration	Enables zone configuration, whereby the task validation process uses a zone that is set for a particular fabric/VSAN defined within the management console, but that has not yet been activated. By using this action, the validation takes into account all underlying changes including added/ removed zones and zone members. This action is useful to pre-validate zone-configuration changes that are entered from a switch management console (but not yet applied). • Zone configuration - Fabric/VSAN from which to load the zone configuration information.

Remove Authorized Path	Removes a host policy. • Remove - Click the **no paths selected** link to view a list of hosts for which a policy is defined, and then select the host you want.
Remove Controller from a Storage	Removes a port controller from a storage array using these parameters: • Controller - WWN of the controller you want to remove. • Storage name - Corresponding array name (filled in automatically after you select a controller).
Remove Controller from a Tape	Removes a controller from a tape device using these parameters: • Controller - WWN of the controller you want to remove. • Tape name - Corresponding tape name (filled in automatically after you select the control).
Remove HBA from a Host	Removes an HBA from a host using these parameters: • HBA - WWN of the HBA adapter to remove. • Host - Corresponding host name (filled in automatically after you select the HBA).
Remove Ports from VSAN	Removes one or more ports on a specific switch from a VSAN. The parameters are - • Remove ports - Ports to be removed from the VSAN. Select one or more ports from the list of available switch ports. • Switch name - Name of the switch whose ports are being removed (filled in automatically after you select ports). • VSAN - VSAN from which you are removing the ports (filled in automatically after you select ports).
Remove Volume	Removes one or more volumes from a storage array using these parameters: • Volumes - Volumes to be removed. Multiple volumes, if specified, must be defined on the same storage array. The drop-down list includes the status of each volume. • Storage - Name of the storage array where the volumes are defined (filled in automatically after you select the volumes).

Remove Volume Map	Removes the mapping between a volume and a storage port using these parameters: • Mapping - Mapping to be removed. All other parameters display automatically after you select a volume map. • Volume name - Name of the volume whose mapping is being removed (filled in automatically after you select a volume map). • Storage name - Storage array where the volume is defined (filled in automatically after you select a volume map). • Port name - Port, on the storage array, for which the volume mapping will be removed (filled in automatically after you select a volume map). • LUN name - Logical Unit Number used by the host to access this volume (filled in automatically after you select a volume map).
Remove Volume Mask	Removes the masking between a disk volume (storage port) and a host using these parameters: • Masking - Volume mask to be removed. Select a mask from the list of available masks. All other fields display automatically after you select a mask. • Initiator - Host port for which the masking is being removed (filled in automatically after you select the mask). • Through port - Storage port for which the masking is being removed (filled in automatically after you select the mask). • Storage name - Storage array where the volume is defined (filled in automatically after you select a mask). • Volume - Name of the volume that is currently masked to the host port, and for which the masking is being removed (filled in automatically after you select a mask).
Remove VSAN	Removes a VSAN from one or more switch devices using these parameters: • Zone member - Member to be removed from its zone. All other fields display automatically after you select a member. • Zone - Zone where the member is currently defined (filled in automatically after you select the member). • Fabric/VSAN - Fabric/VSAN where the zone is currently defined (filled in automatically after you select the member).
Remove Zone	Remove a zone from a fabric using these parameters: • Zone - Name of the zone being removed. • Fabric/VSAN - Fabric/VSAN where the zone is currently defined (filled in automatically after you select the zone)

Remove Zone Member	Remove a member from a particular zone using these parameters: • Zone member - Member to be removed from its zone. All other fields display automatically after you select a member. • Zone - Zone where the member is currently defined (filled in automatically after you select the member). • Fabric/VSAN - Fabric/VSAN where the zone is currently defined (filled in automatically after you select the member).
Shutdown Host	Shut down a host. • Host name (IP) - Host device to be shut down, identified by name and IP address. Select the device from the list of available hosts.
Shutdown Storage	Shut down a storage array. • Storage name (IP) - Storage device to be shut down, identified by name and IP address. Select the device from the list of available storage arrays.
Shutdown Switch	Shut down a switch. • Switch name (WWN) - Switch to be shut down, identified by name and WWN. Select the switch from the list of available switch devices.
Shutdown Tape	Shut down a tape device. • Tape name (IP) - Tape device to be shut down, identified by name and IP address. Select the device from the list of available devices.

Changing the plan state

After validating your plan tasks, you need to change the plan state to Implementation so that OnCommand Insight can track the changes your employees make to your Fibre Channel environment.

Before you begin

Create your change plan and validate the tasks.

Steps

1. Click the OnCommand Insight **Open** menu and select **Planning > Plans**.

   The Task list main view displays all of the change plans.

2. Select the plan you want to change.

3. Right click and select **State > Implementation** or **Completed**.

   When the plan is in the Implementation state, OnCommand Insight begins tracking progress on the tasks.

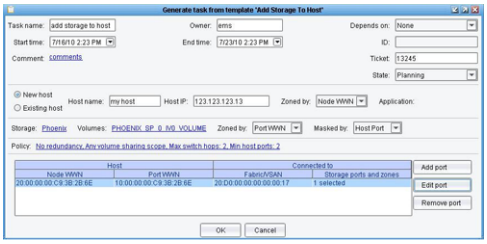
Planning to add storage to a host

OnCommand Insight provides a template listing the common tasks required to add storage to a host.

Steps

1. From the OnCommand Insight **Open** menu, select **Planning > Plans**.
2. From the Task List view, right-click and choose **Templates > Add Storage to Host**.

   This template provides pull-down lists and other tools to select the details for the task.



3. Fill in the task identifying information at the top and any comments you wish to associated with each task.
4. To define an action for an existing task, complete the task identification fields (top-most pane) with the same information contained in the original task.

   The action is then added to the existing task.

After you finish

Validate the tasks and change the plan status to **Implementation** when you are ready to begin the work.

Using the Decommission Host template to reclaim host resources

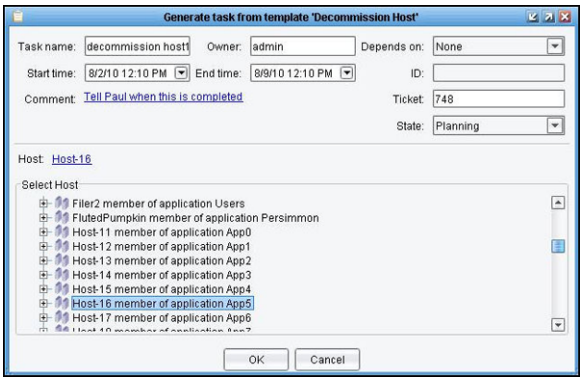
You can use the Decommission Host template to generate a task and the task's required action in order to disconnect a host from the SAN and reclaim its resources.

Steps

1. To use the decommission host template, from the OnCommand Insight **Open** menu, select **Planning > Plans**.
2. Right click a line in the **Tasks** main view and select **Templates > Decommission Host**.
3. Enter a **Task Name** and **Owner**.
4. To make this new task dependent on a previously created task, select that task name from the **Depends on** list.
5. Enter a **Start time** and **End time** so that all of the network or storage engineers performing the tasks know when their work needs to be completed.
6. To add comments, click the **Comment** link and enter text in the lower pane.

7. Click the **No host selected** link to display the list of hosts.
8. Select a host from the list.

   The selected host name displays, as shown in this example:



9. Click **OK** to generate a set of actions to decommission the host, including disconnecting ports, removing zones, and removing masking.

   The plan is shown in the Tasks main view.

   Note: If the actions are appropriate for the current time *but might be invalid later*, Insight displays a warning.

10. Right-click the task that you generated in the **Tasks** main view and select **Validate task**.
11. Click the **Tasks Actions** detail view icon to display the data for your environment relating to this task.
12. To expand or modify the generated list of tasks, right-click an action in the **Tasks Actions** detail view and select one of these options to make changes to the task list:

    - Add action
    - Edit action
    - Delete action
    - Disable action
    - Enable action
    - Move up
    - Move down

Tracking tasks

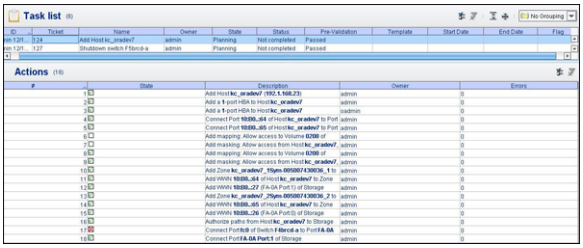
To check whether the planned actions were performed correctly, incorrectly, or not at all, view the Task Actions detail view for the plan.

Steps

1. From the OnCommand Insight **Open** menu, select **Planning > Plans**.
2. Select the plan you are tracking.

If the Status field for the plan indicates that the plan is "Not completed," one or more of the actions have not been performed or were not successfully completed.

3. Click the **Task Actions** detail view icon to display the list of Actions for the selected plan, as shown in this example.



4. To see the status of the individual actions in the plan, examine the check box before each task for these status indicators:
   - A green check indicates that the action was performed successfully.
   - A red "X" indicates an error during the execution of the action (for example, host not physically added).
   - An empty check box indicates that the action has not been executed.
5. To review all user actions in OnCommand Insight, use the Audit feature.

Auditing system and user activities

If you want to track down unexpected changes, you can view an audit trail of Insight system and its user activities.

About this task

Insight generates audit entries for any user activities that affect the storage network or its management, including the following:

- Logging in
- Authorizing or unauthorizing a path
- Updating an authorized path
- Setting global policies or thresholds
- Adding or removing a data source
- Starting or stopping a data source
- Updating data source properties
- Adding, editing, or deleting a task
- Removing an application group
- Identify or changing the identification for a device

Steps

1. From theInsight **Open** menu, click **Configuration > Audit**.

   The Audit view appears.

2. Position your cursor over the Details column to see the complete text.

Exporting tasks to a CSV file

You can use the export to a CSV file facility to import plans from the Task list main view if you want to use the information in another program besides OnCommand Insight.

Steps

1. Click the OnCommand Insight **Open** menu, select **Planning > Plans**.
2. To export the plan tasks from Insight, select **File > Export Task list Table**.
3. Identify the plan rows and columns you want to export from the **Task** list main view.
4. Click **Browse** to select a CSV file or create a new file in a directory.
5. Click **Open** to load the selected file.
6. Click **OK** to export the selected data.

Planning tasks reference

Insight helps you create plans to implement changes in your Fibre Channel environment, including consolidation and migration projects. These tasks are performed by your employees and tracked in Insight.

Task List view

The Task List view shows all of the plans currently available for Fibre Channel environments. This view summarizes active and completed plans.

Navigation

You can access this main view in one of the following ways:

- Click the Open menu and select **Planning > Plans**.
- Click the **Plans** tab at the top of the client.

Column descriptions

The specific columns displayed in this view depend on your OnCommand Insight license. All of the possible columns for this view are described.

ID

Internally generated ID (read-only).

Ticket

Number of the plan/project as it appears in the change ticketing/help desk system or any other number that identifies the change.

Name

Name of the plan entered when the plan was created.

Owner

Name of the person responsible for the plan.

State

The phase of the plan development and execution:

- Planning - You are planning and entering the task.
- Implementation - You have begun execution of the plan. In this state, OnCommand Insight checks the task against outstanding violations and marks the violations as Planned if they are found to correlate to the task.
- Completed - The plan is completed but remains for historical tracking purposes.

Status

This column lists the processing status of the task:

- **Not completed** means that one or more of the task actions have not been performed or were not successfully completed in your monitored environment.
- **Completed** means the task has been finished in your monitored environment.
- **Failed** indicates that the task could not be validated as Complete or Not complete when the task was right-clicked and Validate was selected.

Pre-Validation

Tasks have passed integrity tests or not.

Template

Name of any template used to create the plan (Add Storage to Host or Decommission Host).

Start Date

Plan start date.

End Date

Plan end date.

Flag

If there are violations associated with a task, an icon displays in this field. If a task is acting on a path that has a violation, the task is considered associated with the violation.

Task Actions view

The Tasks Action view lists the sequence of actions required to complete the task selected in the Task List. These actions should be executed in the order that they appear at the table.

Navigation

To display the Actions list for a specific plan, click the Open menu and select **Planning > Plans**. Select a plan in the Task List, and click the **Tasks Action** icon.

Column descriptions

The tracking data for the actions in the selected plan are listed in this detail view.

#

Number indicating the order in which the actions should be performed.

State

The check box containing one of these status indicators:

- A green check indicates that the action was performed successfully.
- A red "X" indicates an error during the execution of the action (for example, host not physically added).

- An empty check box indicates that the action has not yet been performed.

Description

Action type with device details.

Owner

Name of the person responsible for performing the action.

Errors

Number of errors related to the action.

Errors view

This plan view lists any errors made in planning the tasks.

Errors differ from future violations because they refer to problems that do not affect access paths, but that still prevent a successful implementation of the task (for example, trying to connect a cable to a port that is not free).

Navigation

To display the Actions list for a specific plan, click the Open menu and select **Planning > Plans**. Select a plan in the Task List, and click the **Errors** icon.

Descriptions

The action plan errors are listed in this view.

Action

Planned action that will cause an error but does not affect the access paths.

Description

explanation of the problem that will result from the planned action.

Future Violations view

This plan view lists any access-path violations that will occur at the end of the completed task, if not resolved before implementation.

Use the Analyze Violation tool to examine the future violations. This tool only works on a single path, so expand (+) the Future Violations list to display each path you want to analyze.

Navigation

To display the Actions list for a specific plan, click the Open menu and select **Planning > Plans**. Select a plan in the Task List, and click the **Future Violations** icon.

Descriptions

Each access-path violation, that will occur at the end of the completed task, listed in this view contains this information.

blank

Applicable with any presentation order other than No Grouping. Column that organizes the data according to the selected grouping format. The number in parentheses indicates the number of violations reported in each (grouped) row.

Violation Type

Description of the violation using one of the predefined violation types.

Host

Name of the host from which the violating path originates.

Storage

Name of the storage device where the data for this path resides.

Storage Alias

User-defined storage identification.

Volume

Name of the volume where the data for this path resides (applicable with disk storage only).

Capacity (GB)

Size of the volume, in gigabytes.

Application

Applicable if the violating path's host is assigned to run specific applications. Name of the application(s) to which the reported host is dedicated.

Application Priority

Applicable if the host is assigned to run specific applications.

Tenant, Line of Business, Business Unit, Project

Columns listing the business entity components associated with the violation.

Host Ports

The names of the host ports that will be involved in the future violation.

Storage Port Count

The number of storage ports that will be involved in the future violation.

Hops

The number of FC switch devices that the path traverses from the host to the storage.

Sharing

Level of volume sharing permitted by the host, as defined when the path was authorized.

Host Fabrics

Comma-separated list of fabrics to which the host is connected (fabric name if available; otherwise the fabric WWN).

annotations

User-defined terminology associated with the violation including Note and Violation Severity.

Future Changes view

This plan view lists the changes that will be created as a result of the ordered execution of the task actions.

Navigation

To display the Actions list for a specific plan, click the Open menu and select **Planning** > **Plans**. Select a plan in the Task List, and click the **Future Changes** icon.

Column descriptions

The changes that the actions will make are listed in this detail view.

Action

The action that will result in the change.

Event

The change that the action will make.

Streamlined switch migration planning

SAN administrators are frequently required to migrate from existing switching infrastructure to newer switches while maintaining the storage services provided to the applications. This effort usually requires iterating over thousands of configuration parameters residing in different devices, fabrics, scripts, storage management tools, and spreadsheets and then cross-referencing them in order to construct and identify the storage service. This manual process is prone to human error and often so time-consuming that it adds weeks to the overall migration time line. OnCommand Insight provides automation tools to streamline and improve the quality of this process.

To perform a switch migration quickly and efficiently, a SAN administrator is expected to fulfill these requirements:

- Maintain ongoing business operations during the migration process by avoiding application disruption and downtime.
- Gain visibility to the risks and impact associated with the migration process in order to be able to mitigate them.
- Assure that the post-migration storage service quality is at least at the same level that it was prior to the migration.
- Maintain control during and after the migration by overseeing all changes that are being performed in the SAN environment to successfully implement the migration.

OnCommand Insight has developed tools that automate the migration process, significantly reducing the time frame required to complete the migration. Then OnCommand Insight provides a post migration quality check.

Note: OnCommand Insight ***does not*** perform any switch migration activities for you. You must use vendor storage tools and your own internal procedures to carry out the migration. OnCommand Insight is providing visibility into the switch migration process so that you do not have to run multiple storage tools in order to determine host redundancy prior to the migration.

Switch migration phases

The OnCommand Insight switch migration process provides automation tools to assist SAN administrators in the three phases of switch migration.

- **Preparation Phase** - In this phase, a SAN administrator is required to identify all storage services that are affected by the migration including access, redundancy, performance and recoverability. OnCommand Insight allows the administrator to capture ALL paths that will be affected by the migration. Then the administrator can use OnCommand Insight to simulate the changes in the environment to understand the migration impact for each service in order to avoid any disruptions to ongoing business operations. These automation features streamline the preparation phase.
- **Migration Phase** - Once the preparation is done, the administrator performs the actual migration using vendor storage tools and corporate procedures. This process needs to be monitored and coordinated by multiple internal departments and often third parties.
- **Post-Migration Phase (Quality Assurance Phase)** - Following the migration phase, the SAN administrator is required to ensure that all of the storage services maintained their quality level. This is done by comparing the current quality level of each storage service to its previous state. In this phase, it is required to iterate again over the same configuration parameters that were done in the pre-migration phase.

Setting up a switch migration

During the Preparation Phase the administrator defines the switch migration and then sets up a migration task and associates switches with this task.

About this task

To prepare for the switch migration, you need to identify all storage services that are affected by the migration including access, redundancy, performance, and recoverability.

OnCommand Insight allows you to capture all paths that will be affected by the migration and simulate the impact of the changes on your environment. You can also provide a timeframe for the migration to take place within the simulation to better identify and manage the migration task.

You begin to define the switch migration in OnCommand Insight by creating a migration task:

Steps

1. Click the OnCommand Insight **Open** menu and select **Planning > Migrations**.

   The Migration Tasks list displays all of the switch migration plans created in OnCommand Insight.

2. Right click anywhere on this list and select **Add Task**.

3. In the dialog box, create a migration task by entering this information:

   - **Name** of the migration task (required)
   - **Owner** is the name or title of the person responsible for this migration. (optional)
   - **Start Date** is the expected start date of the migration. (optional, but used for tracking purposes)
   - **End Date** is the expected completion date for the migration. (optional, but used for tracking purposes)
   - **Comments** (optional, but often used to provide special instructions)

   The system fills in the **Ticket** number automatically.

4. Click **Next** to display the list of switches in the OnCommand Insight inventory.

5. You can filter the list using the **Fabric/VSAN** column so that the switches you see are based on the fabric you intend to migrate. Click the check boxes to select the individual switches that are targeted for this migration.

6. Click **Finish**.

   This places the project summary into the Migration Tasks list with the project State set to "Preparation."

After you finish

Check to be certain that the switches listed in this plan are included in the list of OnCommand Insight data sources so that they can be accurately monitored during the migration.

Analyzing switch migration simulation results

Based on the information in your switch migration plan, OnCommand Insight identifies all of the affected paths and the part of the fabric that will be removed, and simulates the proposed changes. Administrators use this information to correct foreseen violations, make environment changes, and alert business units about potential outages.

Before you begin

Be certain that your OnCommand Insight SAN path policies are up to date for the affected switches and create a switch migration plan in **Planning > Migrations**.

About this task

OnCommand Insight uses the information in the switch migration plan to simulate the proposed changes in your environment, and displays the simulation results in the Affected Paths and Impact views.

Steps

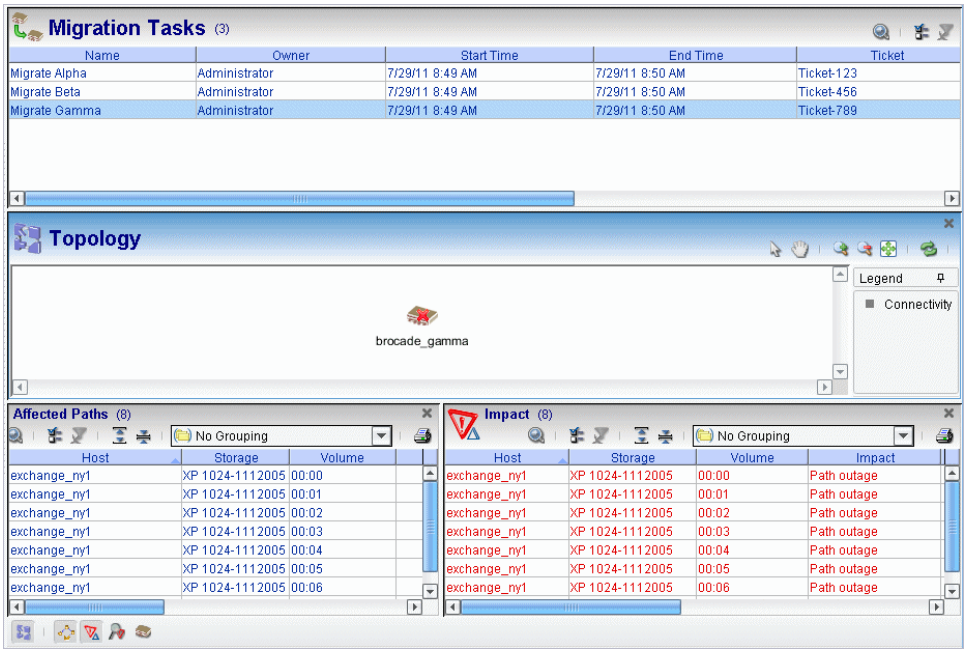
1. To see illustrations and associated details of the affected paths, click the **Topology** icon.

   Switches marked with a red "X" are the switches selected for migration, as shown in the example below. When you are migrating an entire fabric, all of the switches in the Topology view must be marked with a red "X."

2. Select the switch migration project summary in the Migration Tasks list and click the **Affected Path** icon to display a list of all of the host to storage paths associated with the switches that are intended for migration.

3. To prevent problems, review the foreseen SAN violations identified for any of the affected paths and clear significant violations before beginning any migration tasks.

4. OnCommand Insight simulates the impact that migrating the selected switches will have on the paths associated with the switches. Click the **Impact** icon to review any violations with their migration risks, as shown in this example.



One of the most common path violations is "Path outage," as shown in this example.

5. For any High risk migration violations such as an outage, the administrator should evaluate this risk and might propose a workaround to avoid it. If a workaround is added to the plan, OnCommand Insight simulates the revised plan, shows the effect of the revision, and adjusts the risk level.

6. Applications with their priority are shown in both the affected paths and impact information. The administrator needs to analyze the violations associated with high-priority applications so that preparations can be made in the affected business units to deal with any outages during the migration. The potential business impact of lower-priority application violations also needs to be assessed.

After you finish

Use the affected paths and impact information to alert business unit managers and administrators about potential disruptions.

Switch migration risks identified during simulation

When you create a switch migration plan, OnCommand Insight automatically runs a simulation of this plan and displays data describing the affected paths and indicating a level of risk for the planned migration. It is important to understand these risks and take steps to resolve potential problems before performing the actual switch migration.

If a migration risk for a host is considered High, you need to identify the possible cause for this risk and take corrective actions. Missing redundancy is a common cause for the High risk warning. If you do not or cannot correct this SAN path violation before migration, the host will not have access to any of its storage. If this cannot be corrected before the migration, it is important to notify the business unit and/or system administrator that downtime will occur as part of this migration.

However, a High risk may be reported for a host that does not have any current SAN path violations. This occurs when the Redundancy Policy for the host is set as "None." After the migration simulation, the Affected Paths view shows no current violation because no redundancy is normal for this host, but the risk still exists.

Best practice: Analyze any High risk identified during migration to be certain that you understand the reason for the warning and correct any problems before performing the switch migration.

Checking host policies

If you have a High risk warning for a planned switch migration and no current SAN path violations for the affected host, you need to check the policies for the host.

Steps

1. Select **Assurance > SAN Path Policies**.
2. Select the affected host from the SAN Path Policies view.
3. Click the **Properties** icon to list the policies for this host.

   If the Redundancy field lists "None" as the value, the selected host was created with a discrete policy that does not require redundancy.
4. To verify that conclusion, select **Inventory > Hosts** and select the host from the list.
5. Click the **Topology** icon and select **Enclosure** from the Topology menu.

   You might want to move the mouse pointer over the items in the topology diagram to display details describing each.

Result

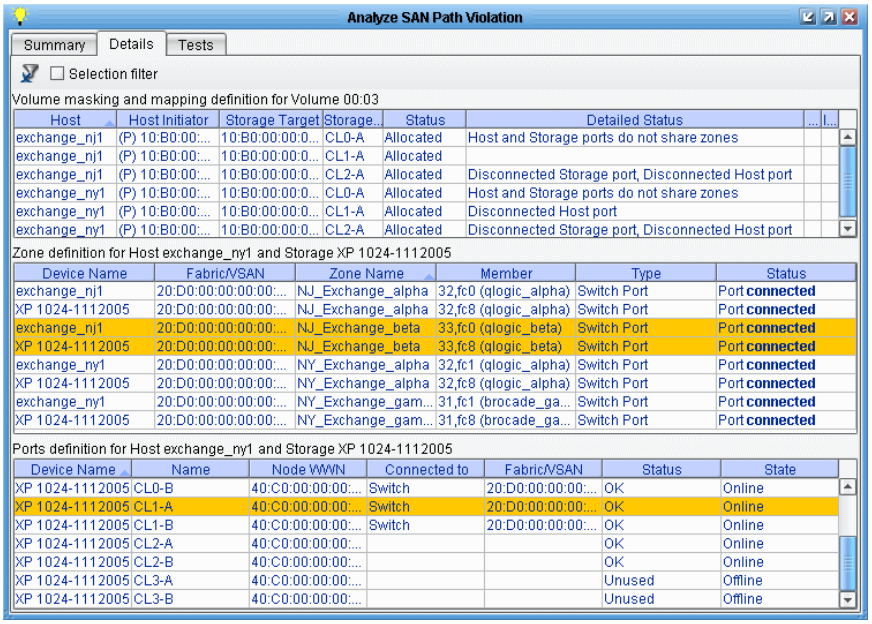
A host without SAN path violations might still be a high-risk migration candidate because of a lack of redundancy.

Analyzing switch migration violations

When examining violations for the planning switch migration, you can display detailed SAN path violation data to resolve potential migration problems.

Steps

1. Select a violation listed in the Affected Paths or Impact views.
2. Right click and select **Analyze Violation**.
3. In the Analyze SAN Path Violation dialog box, note the description of the violation type on the Summary page and click the **Details** tab.
4. To display unfiltered details for this path violation, remove the check in the **Selection filter** box.
5. Click items in the list at the top to highlight the elements affected in the zone and port definition panels below, as shown in this example.



6. Use the data to determine what needs to be changed in the switch migration plan to remove the violation or manage the condition.

Adding data sources before switch migration

Prior to starting the production migration, you must add all relevant data sources for the new switches. For example, when migrating from McData to Cisco, you need to create new data sources in OnCommand Insight for the Cisco fabric.

Before you begin

Before adding a new type of data source, read the instructions for preparing to add a data source and the accompanying vendor information.

Steps

1. To add a data source for the target environment, select **Configuration** > **Data Sources**.
2. Select **Action** > **Add Data Source** to open the wizard that guides you through the process of adding a new data source.

Monitoring switch migration

Before performing the migration tasks, use the Migration Tasks list to set the State to "Migration in Progress" and record the start day and time. When the migration is being performed, the administrator might capture path data and audit system user actions.

Before you begin

Open Insight and check to be certain that the new switch is included in the data sources list.

Steps

1. Select the project information in the Migration Tasks main view. Right click and select **Set State > Migration in Progress**. This state captures the environment status prior to the migration to serve as a comparison point after the migration.

   Note: After you change the task state to "Migration in Progress," the only migration task attributes you can modify for this task are the Comments and the State.

2. Right click the project information and select **Set Migration Start Time** to pinpoint the start day and time to use during the post-migration phase.
3. The administrator or engineers can begin the switch migration tasks.
4. Add the Data Source for each new switch and be certain that they were acquired without any failures.

   Successfully acquired data sources are required for accurate monitoring of your storage environment.

5. During the migration, the administrator might right click on the project information and select **Capture Paths** to update the paths that the system is monitoring. The Capture Paths feature only records data if a new path is introduced to the system after the migration task has been created.
6. To monitor all user actions, the administrator clicks the **Open** menu and selects **Admin > Audit**.
7. For a long migration project, you might want to monitor changes in the Quality Assurance detail view. Click the **Quality Assurance** icon below the Migration Tasks list for this view.

Verifying switch migration

During or after the migration, you can use the Quality Assurance information to monitor and verify the switch migration tasks.

Before you begin

You need to change the project State in the Migrated Tasks list to "Migration in Progress" and set the project start time to provide the Quality Assurance data. This is based on a comparison between the current real time and the time that the user set as the "Set Migration Start Time."

Steps

1. When you want to review the success of your migration project, right-click the switch migration project summary in the Migration Tasks list and select **Set State > Quality Assurance**.
2. Click the **Quality Assurance** icon.

   This detail view shows the actual, not simulated violations, in the Pre-migration Violations column.

3. Check the **Completed** column. If the migration process is successfully completed, all elements have a green check.

   Precisely, this means that the path is in an equal or better state than during the pre-migration status.

4. If the Completed column contains a red mark, the path has not been migrated or the migration resulted in a violation such as Missing Redundancy. Check the **Switch Removal Violations** column for these migration violations.
5. Make the necessary changes to correct any switch removal violations.

6. If you want to review vendor supplied information about the migrated switches, click the **Migrated Switches** icon.

Switch migration reference

The switch migration planning facility provides a main view summary of the switch migration tasks with topology and detail views for a selected task.

Migration Tasks view

The Migration Tasks view displays the information entered for the switch migration when it was set up along with an actual start date and time.

Navigation

To display the Migration Tasks list, click the Open menu and select **Planning > Plans** or the **Migrations** tab at the top of the client.

Column descriptions

These switch migration details are displayed in this view.

Name
Name of the switch migration project entered during the set up phase.

Owner
Name of the person or the job title of the person who is responsible for managing this project.

Start Time
Date and time the switch migration is planned to begin.

End Time
Date and time the switch migration is planned to end.

Ticket
Work ticket number assigned to this project.

State
Current status of the project such as Preparation, Migration in Progress, or Completed.

Comments
Any additional information about the project added during the project set up.

Actual Start Time
Date and time that the project state changed to "Migration in Progress."

Affected Paths view

The Affected Paths view shows all devices and elements associated with each path, including the host, storage array, volume, migration risk, application, application priority and business unit. The detail view indicates whether there are any outstanding violations on these paths. **Best practice**: Fix these violations prior to the migration.

Navigation

To display the Migration Tasks list, click the Open menu and select **Planning > Plans** or the **Migrations** tab at the top of the client. Select a switch migration plan in the Migrations Task list, and click the **Affected Paths** icon to see a list of all of the paths affected by this migration plan.

Column descriptions

These path details are displayed in this view.

Host

Name of host from which the path originates.

Storage

Name of the storage device where the data for this path resides.

Volume

Name of the volume where the data for this path resides (not applicable for tape devices).

Current Violations

Types of SAN path violations that will occur (for example, Missing Active Host Ports, Missing Redundancy, Path Outage, Single Point of Failure, Switch Hop Count, Unauthorized Path, and Unauthorized Sharing).

Migration Risk

The migration simulation describes the risk as High, Low or None and provides more information in the Impact view.

Application

Name of the application assigned to this host.

Application Priority

Critical, High, Medium, or Low priority was assigned to this application when it was linked to the host.

Tenant, Line of Business, Business Unit, Project

Columns listing the business entity components associated with the path.

Impact view

OnCommand Insight simulates the impact of removing the selected switches on the paths associated with these switches. This impact is displayed as a path violation. If changes to the plan correct a potential problem, the violation is removed from this view.

Navigation

To display the Migration Tasks list, click the Open menu and select **Planning > Plans** or the **Migrations** tab at the top of the client. Select a switch migration plan in the Migrations Task list, and click the **Impact** icon to see a list of all of the paths affected by this migration plan.

Column descriptions

These migration impact details are displayed in this view.

Host

Name of host from which the path originates.

Storage

Name of the storage device where the data for this path resides.

Volume

Name of the volume where the data for this path resides (not applicable for tape devices).

Impact

Types of problems that will occur when removing the selected switches (for example, Missing Redundancy or Path Outage).

Migration Risk

Each impact has a risk associated with it. The risks are defined as follows:

- **High Risk** indicates that the path will be in an outage state during the planned migration. The risk needs to be evaluated and a workaround may be proposed to address that risk. If a workaround is implemented such as adding additional HBAs to the host, then the Impact Detail changes to reflect the new state of the host.
- **Low Risk** indicates that there will be no downtime risk during the migration. However, there will be a lack of redundancy during the planned migration. This is the expected behavior in most instances.
- **None** indicates that there will be no migration impact on the path. This risk could only occur if you have three or more HBA ports in a host connected to three or more different fabrics.

Application

Name of the application assigned to this host.

Application Priority

Critical, High, Medium, Low priority assigned to this application when it was linked to the host.

Tenant, Line of Business, Business Unit, Project

Columns listing the business entity components associated with the path.

Quality Assurance view

This detail pane lists Pre-Migration Violations and Switch Removal Violations for post-migration verification. If the migration process has occurred successfully, all elements show a green checkmark in the Completed column.

Navigation

To display the Migration Tasks list, click the Open menu and select **Planning > Plans** or the **Migrations** tab at the top of the client. Select a switch migration plan in the Migrations Task list, and click the **Quality Assurance** icon to see a list of all of the paths affected by this migration plan.

Column descriptions

The post-migration verification details are displayed in this view.

Host

Name of host from which the path originates.

Storage

Name of the storage device where the data for this path resides.

Volume

Name of the volume where the data for this path resides (not applicable for tape devices).

Pre-Migration Violations

Types of violations that existed prior to the migration (for example, Missing Active Port Hosts and Single Point Failure).

Switch Removal Violations

The system shows either the simulated violation or the real violation (Missing Redundancy, Path Outage). The simulated violation is shown while the switch is connected. The current (real) violation is shown when the switch is disconnected.

Completed

If this column contains a green check, the path has been successfully migrated. A successful migration means that the current status of the path is equal to or better than to the pre-migration status. The pre-migration status was captured when the user entered the "Set Migration Start Time." If this column contains a red "X," the path has not been successfully migrated.

Last Update Time

The last date and time an action was performed on the path.

Application

Name of the application assigned to this host.

Application Priority

Critical, High, Medium, or Low priority was assigned to this application when it was linked to the host.

Tenant, Line of Business, Business Unit, Project

Columns listing the business entity components associated with the path.

Migrated Switches view

This view shows which switches were selected for this migration task and the current status of those switches. This information is taken from the device itself.

Navigation

To display the Migration Tasks list, click the Open menu and select **Planning > Plans** or the **Migrations** tab at the top of the client. Select a switch migration plan in the Migrations Task list, and click the **Migrated Switches** icon to see a list of all of the paths affected by this migration plan.

Descriptions

The migrated switch status is displayed in this view.

Name

Switch name, as provided by the SAN manager at the switch console.

IP Address

IP Address assigned to the switch.

Vendor

Name of the manufacturer of the switch.

Model

Manufacturer's model number for the switch.

Firmware

Version of the firmware running on the switch.

Port Count

Number of licensed ports on the switch.

Status

Current status of the switch as reported by the switch itself. Refer to the manufacturer's device documentation for an explanation of these values.

Fabric/SAN

Fabric/VSAN on which this switch is configured to operate.

WWN

World Wide Name of the switch.

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