



OnCommand® Insight 7.2.3

# Reporting Guide

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## Welcome to OnCommand Insight reporting

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OnCommand Insight Reporting Connection is a business intelligence tool that enables you to view pre-defined reports or create custom reports. OnCommand Insight Reporting Connection generates reports from the Data Warehouse (DWH) data.

With OnCommand Insight Reporting Connection you can perform the following tasks:

- Run a pre-defined report
- Create a custom report
- Customize the report format and delivery method
- Schedule reports to run automatically
- Email reports
- Use colors to represent thresholds on data
- Present a collection of report results on a dashboard
- Add tabs to views in order to show a dashboard collection of report results

Pre-defined reports are the standard OnCommand Insight reports. This guide describes the pre-defined reports that are available with all of the product licenses and describes how to create custom reports using different report authoring tools.

## Accessing the OnCommand Insight Reporting Portal

You can access the OnCommand Insight Reporting Portal directly from a web browser or from the Data Warehouse Portal. You can use the Reporting Portal to access predefined reports or to create your own reports using Data Warehouse data.

### Opening the Reporting Portal from Data Warehouse

You can open the Reporting Portal directly from the Data Warehouse by clicking the reporting icon.

#### Steps

1. Open a web browser.
2. Enter the following URL:  
`http://host_name/dwh`
3. Enter your user name and password, and then click **OK**.
4. In the Data Warehouse toolbar, click .
5. In the login page that appears, enter your user name and password, and then click **OK**.

#### Result

The Storage Manager Dashboard is displayed. This is the default landing page of the OnCommand Insight Reporting Portal.

## Opening the Reporting Portal from a web browser

You can access the OnCommand Insight Reporting Portal directly from a web browser.

### Steps

1. Open a web browser.
2. Enter the following URL:

```
http://server-name:9300/p2pd/servlet/dispatch
```

9300 represents the default port that was specified during installation. If another port was specified, you must change the port.

3. Enter your user name and password, and then click **OK**.

### Result

The Storage Manager Dashboard is displayed. This is the default landing page of the OnCommand Insight Reporting Portal.

## Variations due to installed licenses

Data in the OnCommand Insight reports is based upon the OnCommand Insight licenses that you have purchased. For example, if you are not licensed for OnCommand Insight Plan, then you will not receive any data in the capacity reports.

You might see differences between the available reports in your OnCommand Insight system compared to the illustrations in the documentation. These variations are due to differences between the installed licenses on your system and the licenses on the system used to create the illustrations.

For more information about Licenses, see the OnCommand Insight Installation guide.

## Reporting user roles

Each user account is assigned a role with a set of permissions. The number of users is limited by the number of Reporting licenses attached to each role.

Each role can perform the following actions:

### Recipient

Views OnCommand Insight Reporting portal dashboards and reports and sets personal preferences such as those for languages and time zones.

**Note:** Recipients cannot create reports, run reports, schedule reports, export reports, nor perform administrative tasks.

### Business Consumer

Runs reports in Workspace and runs reports interactively in addition to performing all Recipient options.

### Business Author

Views scheduled reports, runs reports interactively, and creates some reports in addition to performing all Business Consumer options.

### Pro Author

Creates reports in addition to performing all Business Author options and has advanced reporting tool options that are available also with Report Studio.

### Administrator

Performs reporting administrative tasks such as the import and export of report definitions, configuration of reports, configuration of data sources, and the shutdown and restart of reporting tasks.

The following table shows the privileges and the maximum number of users allowed for each role:

Feature	Recipient	Business Consumer	Business Author (Insight Plan only)	Pro Author (Insight Plan only)	Admin
View reports in the <b>Public Folders</b> and <b>My Folders</b> tabs	Yes	Yes	Yes	Yes	Yes
Run reports	No	Yes	Yes	Yes	Yes
Schedule reports	No	Yes	Yes	Yes	Yes
Create reports in Query Studio	No	No	Yes	Yes	No
Create reports in Workspace	No	Yes	Yes	Yes	No
Create reports in Workspace Advanced	No	No	Yes	Yes	No
Create reports in Report Studio	No	No	No	Yes	No
Perform administrative tasks	No	No	No	No	Yes
Number of users	Number of OnCommand Insight users	20	2	1	1

When you add a new Data Warehouse and Reporting user, if you exceed the limit in a role, the user is added as “deactivated,” and you need to deactivate or remove another user with that role to give a new user membership.

**Note:** Report authoring capabilities require Insight Plan license. You can add additional Business Author and Pro Author users by purchasing the ARAP (Additional Report Authoring Package). Contact your OnCommand Insight representative for assistance.

These reporting user roles do not affect direct database access. These reporting user roles do not impact your ability to create SQL queries using the data marts.

## Where to find more information about OnCommand Insight

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

- The OnCommand Insight Web page:  
<http://www.netapp.com/us/products/management-software/oncommand-insight/>
- The OnCommand Insight documentation page:  
<http://mysupport.netapp.com/documentation/productlibrary/index.html?productID=60983>
- The NetApp support site:

<http://mysupport.netapp.com>

- IBM Cognos documentation on the web:  
<http://www.ibm.com/analytics/us/en/technology/cognos-software/>
- The NetApp automation storefront where you can download from an extensive collection of NetApp and User-community submitted report templates for OnCommand Insight.  
<https://automationstore.netapp.com>
- OnCommand Insight Discussion Forum:  
<https://forums.netapp.com/welcome>

For information available from the Reporting portal, you can access the OnCommand Insight On-line Help. The help includes access to the Data Warehouse database schema.

## Reporting made easy

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You can generate pre-defined reports from the OnCommand Insight Reporting Portal, email them to other users, and even modify them. Several reports enable you to filter by device, business entity, or tier. The reporting tools use IBM Cognos as a foundation and give you many data presentation options.

- The OnCommand Insight pre-defined reports show your inventory, storage capacity, chargeback, performance, and storage efficiency data. You can modify the pre-defined reports and save your modifications.
- You can create custom reports using the Report Studio and Workspace Advanced reporting tools.
- OnCommand Insight provides quick access to report data through dashboards. You can group your own report selections and display them in your own dashboards.

The report data available to you is controlled by several things, including the following:

- Login access to the OnCommand Insight Reporting Portal, which is defined by roles.
- The setup of the OnCommand Insight Data Warehouse, which stores the data for the reports.

You can generate reports in various formats, including HTML, PDF, CSV, XML, and Excel.

OnCommand Insight accommodates multiple tenancy in reporting by enabling you to associate users with business units. With this feature, administrators can separate data or reports according to the attributes of a user or his affiliation.

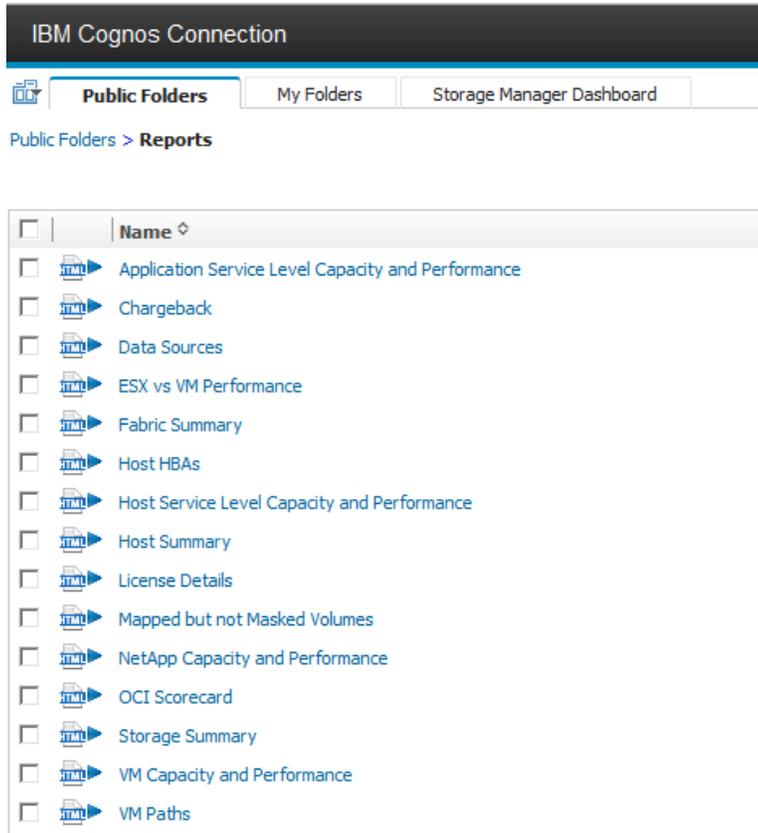
## Navigating to pre-defined OnCommand Insight reports and dashboards

When you open the Reporting Portal, the Public Folders tab is the starting point for you to select the type of information that you require in the OnCommand Insight reports and dashboards.

### Step

1. Click the **Public Folders** tab, and select the information category that you want to use.

Select the **Reports** to access the pre-defined reports. You can select the **Storage Manager Dashboard** to view the dashboard.



## Using predefined reports to answer common questions

OnCommand Insight includes predefined reports that address a number of common reporting requirements, providing critical insight that stakeholders need to make informed decisions about their storage infrastructure.

The following predefined reports are available in **Public folders > Reports** or **Public folders > Vendor Specific Reports**.

Newer versions of reports might be available at the NetApp Storage Automation Store. You should check the Automation Store regularly for reports.

### Application Service Level Capacity and Performance

The Application Service Level Capacity and Performance report provides a high level overview of your applications. You can use this information for capacity planning or for a migration plan.

### Chargeback

The Chargeback report provides storage capacity chargeback and accountability information by hosts, application, and business entities, and includes both current and historical data.

To prevent double counting do not include ESX servers, only monitor the VMs.

An updated version of this report is available at the NetApp Storage Automation Store.

### Data Sources

The Data Sources report shows all the data sources that are installed on your site, the status of the data source (success/failure), and status messages. The report provides

information about where to start troubleshooting data sources. Failed data sources impact the accuracy of Insight reporting and the general usability of the product.

### **ESX vs VM Performance**

The ESX vs VM Performance report provides a comparison of ESX servers and VMs, showing average and peak IOPs, throughput, and latency and utilizations for ESX servers and VMs. To prevent double counting, exclude the ESX servers; only include the VMs.

An updated version of this report is available at the NetApp Storage Automation Store.

### **Fabric Summary**

The Fabric Summary report identifies switches and switch information, including port counts, firmware versions, and license status. The report does not include NPV switch ports.

### **Host HBAs**

The Host HBAs report provides an overview of the hosts in the environment and provides the vendor, model, and firmware version of HBAs, and the firmware level of the switches to which they are connected. This report can be used to analyze firmware compatibility when planning a firmware upgrade for a switch or an HBA.

### **Host Service Level Capacity and Performance**

The Host Service Level Capacity and Performance report provides an overview of storage utilization by host for block only applications.

### **Host Summary**

The Host Summary report provides an overview of storage utilization by each selected host with information for Fibre Channel and iSCSI hosts. The report enables you to compare ports and paths, the Fibre Channel and iSCSI capacity, and violation counts.

### **License Details**

The License Details report shows the entitled quantity of resources you are licensed for across all sites with active licenses. The report also shows a summation of actual quantity across all the sites with active licenses. The summation may include overlaps of storage arrays managed by multiple servers.

### **Mapped but not Masked Volumes**

The Mapped but not Masked Volumes report lists the volumes whose logical unit number (LUN) has been mapped for use by a particular host, but is not masked to that host. In some cases these could be decommissioned LUNs that have been unmasked. Unmasked volumes can be accessed by any host, making them vulnerable to data corruption.

### **NetApp Capacity and Performance**

The NetApp Capacity and Performance report provides global data for allocated, utilized, and committed capacity with trending and performance data for NetApp capacity.

### **OCI Scorecard**

The OCI Scorecard report provides a summary and general status of all assets discovered by OnCommand Insight. Status is indicated with green, yellow, and red flags:

- Green indicates normal condition
- Yellow indicates a potential issue in the environment
- Red indicates an issue that requires attention

All of the fields in the report are described in the Data Dictionary provided with the report.

**Storage Summary**

The Storage Summary report provides a global summary of used and unused capacity data for raw, allocated, storage pools, and volumes. This report provides an overview of all of the storage discovered.

A newer version of this report is available at the NetApp Storage Automation Store.

**VM Capacity and Performance**

Describes the virtual machine (VM) environment and its capacity usage. VM tools must be enabled to view some data, such as when VMs were powered down.

**VM Paths**

The VM Paths report provides data store capacity data and performance metrics for which virtual machine is running on which host, which hosts are accessing which shared volumes, what the active access path is, and what comprises capacity allocation and usage.

**HDS Capacity by Thin Pool**

The HDS Capacity by Thin Pool report shows the amount of usable capacity on a storage pool that is thin provisioned.

**NetApp Capacity by Aggregate**

The NetApp Capacity by Aggregate report shows raw total, total, used, available, and committed space of aggregates.

**Symmetrix Capacity by Thick Array**

The Symmetrix Capacity by Thick Array report shows raw capacity, useable capacity, free capacity, mapped, masked, and total free capacity.

**Symmetrix Capacity by Thin Pool**

The Symmetrix Capacity by Thin Pool report shows raw capacity, useable capacity, used capacity, free capacity, used percentage, subscribed capacity, and subscription rate.

**XIV Capacity by Array**

The XIV Capacity by Array report shows used and unused capacity for the array.

**XIV Capacity by Pool**

The XIV Capacity by Pool report shows used and unused capacity for storage pools.

## Running a report

You can quickly run the pre-defined reports from the OnCommand Insight Reporting Portal. Some reports might require you to select parameters that filter the data to be displayed in the generated report.

**Steps**

1. Select the folder containing the types of reports you want.
2. Click the report link to generate the report or to open the parameter filtering page for that report.
3. If the report has a parameters page, select the report parameters you want to use to filter the data displayed.

In many reports, you can leave the parameter selections untouched to select all of the possible types.

4. Click **Finish** to generate the report.

## Managing reports

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For each report, you can select the **More** link in the Actions column, and access all of the report operations, such as setting report properties, scheduling reports, or emailing reports. Administrators have more management options available than other users.

Administrators can set permissions for other report users according to their OnCommand Insight roles.

## Customizing a report's output format and delivery

You can customize the format and delivery method of a pre-defined OnCommand Insight report.

### Steps

1. Log into the OnCommand Insight Data Warehouse.
2. Open the OnCommand Insight Reporting Portal and select the report you want to customize.
3. To the right of the report name are several Actions icons and a More link. Click the **Run with options** triangle icon to open the output format options for this report.

The screenshot shows a dialog box titled "Run with options - Storage Capacity Usage Trends by Timeframe". The dialog contains the following sections:

- Format:** A dropdown menu set to "HTML".
- Accessibility:** A checkbox labeled "Enable accessibility support" which is currently unchecked.
- Language:** A dropdown menu set to "English (United States)".
- Delivery:** Three radio buttons: "View the report now" (selected), "Save the report", and "Print the report:". Below this is a "Printer location:" field with a "Select a printer..." link.
- Prompt values:** A checkbox labeled "Prompt for values" which is checked.

At the bottom of the dialog are "Run" and "Cancel" buttons.

4. Set these options:
  - **Format** as HTML, PDF, Excel 2007, Excel 2003, Delimited Text (CSV), or XML
  - **Accessibility** check to enable accessibility support for this report
  - **Language** select from the list of available languages. The default is English (United States).
  - **Delivery** select to view the report, save it, or print the report on a selected printer
  - **Prompt values** check to prompt for values
5. Click **Run** to produce the report using the selections.

## Scheduling reports

You can set up the report to run at a recurring date and time and set its runtime priority. You can run it using the default values or specify the options, and you can disable the schedule without losing any of its details.

### Steps

1. From the OnCommand Insight Reporting Portal, select the report.
2. Click the **More** link and then click **Modify schedule**.
3. Enter the schedule parameters for the report.  
For more information about these selections, click the **Help** link.
4. Click **OK**.

## Setting up email notification in Reporting Connection

Setting up email notification is required to send out reports from Query Studio or Reports Studio via email.

### Steps

1. From the Windows Start menu, select **All Programs > IBM Cognos > IBM Cognos configuration**.
2. Under the Explorer column at the end, select **Notification**.
3. On the right side of the **Notification** screen, enter the following information:
  - SMTP mail server: Enter the server name registered in DNS or SMTP server IP, for example, 10.10.10.10:25.
  - Account and password needed to log into the mail server.
  - Default sender: Enter the email account that was added to the generated emails as the sender, for example, user@domain.com.
4. Select **File > Save**.
5. In the Cognos Configuration window, right-click **Local Configuration**, and then select **Restart** to restart the Cognos service.  
You could also select **Actions > Restart** or **Start** if the server is not running.
6. Test the email server setting:
  - a. From the Windows Start menu, select **All Programs > IBM Cognos > IBM Cognos configuration**.
  - b. Right-click **Notification**, and then select **Test**.

## Managing dashboards

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OnCommand Insight provides report groupings in the form of dynamic dashboards to show different views of data relating to a specific management concern. Clicking elements in the dashboards displays more detailed information.

### About this task

The dashboards group information on a subject of interest and provide these dynamic features:

- Click on chart elements to regenerate charts showing more details for the selected items.
- Links to other reports and more detailed information.

If you have a favorite dashboard, you can add a tab for it using one of these methods:

- Add the dashboard tab from the public folders.
- Add the dashboard tab from User Preferences.

### Related tasks

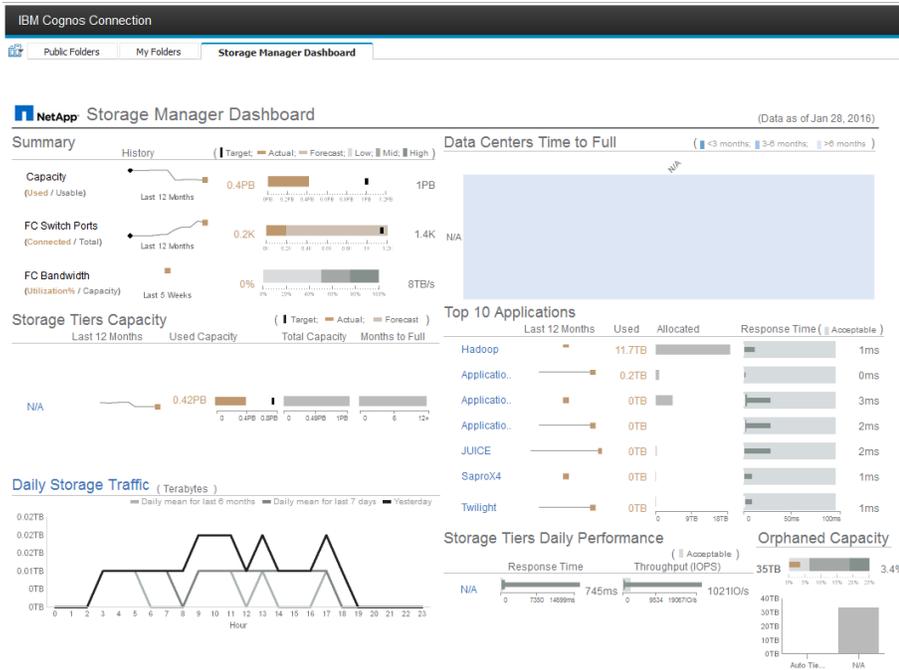
[Using dashboards to survey information and display details](#) on page 17

## What the Storage Manager Dashboard enables you to do

You can use the Storage Manager Dashboard for the daily management of your storage services.

The Storage Manager Dashboard provides you with a centralized visualization that enables you to compare and contrast resource usage over time against the acceptable ranges and previous days of activity. Showing only the key performance metrics for your storage services, you can make decisions about how to maintain your data centers.

The dashboard comprises seven components that contain contextual information on certain aspects of your storage environment. You can drill down on the aspects of your storage services to perform an in-depth of analysis of a section that interests you most.



## Summary

This component shows the used versus usable storage capacity, total switch ports versus the number of switch ports connected, and total connected switch port utilization versus the total bandwidth, and how each of these trend over time. You can view the actual utilization compared against the low, mid, and high ranges, which enables you to compare and contrast usage between Insight projections and your desired actuals, based on a target. For capacity and switch ports, you can configure this target. The forecast is based on an extrapolation of the current growth rate and the date you set. When the forecasted used capacity, which is based on future usage projection date, exceeds the target, an alert (solid red circle) appears next to Capacity.

## Storage Tiers Capacity

This component shows the tier capacity used versus the capacity allocated to the tier, which indicates how the used capacity increases or decreases over a 12-month period and how many months are remaining to full capacity. Capacity usage is shown with values provided for actual usage, the usage forecast by Insight, and a target for capacity, which you can configure. When the forecasted used capacity, which is based on future usage projection date, exceeds the target capacity, an alert (solid red circle) appears next to a tier.

You can click any tier to display the Storage Pools Capacity and Performance Details report, which shows free versus used capacities, number of days to full, and performance (IOPS and Response Time) details for all the pools in the selected tier. You can also click any storage or storage pool name in this report to display the asset page summarizing the current state of that resource.

## Daily Storage Traffic

This component shows how the environment is performing, if there is any large growth, changes, or potential issues compared to the previous six months. It also shows the average traffic versus the traffic for the previous seven days, and for the previous day. You can visualize any abnormalities in the way the infrastructure is performing because it provides information that highlights both cyclical (previous seven days) and seasonal variations (previous six months).

You can click the title (**Daily Storage Traffic**) to display the Storage Traffic Details report, which shows the heat map of the hourly storage traffic for the previous day for each storage system. Click

any storage name in this report to display the asset page summarizing the current state of that resource.

### Data Centers Time to Full

This component shows all the data centers versus all of the tiers and how much capacity remains in each data center for each tier of storage based on Insight forecasted growth rates. Tier capacity level is shown in blue; the darker the color, the lesser time the tier at the location has left before it is full.

You can click a section of a tier to display the Storage Pools Days to Full Details report, which shows total capacity, free capacity, and number of days to full for all the pools in the selected tier and the data center. Click any storage or storage pool name in this report to display the asset page summarizing the current state of that resource.

### Top 10 Applications

This component shows the top 10 applications based on the used capacity. Regardless of how the tier organizes the data, this area displays the current used capacity and share of the infrastructure. You can visualize the range of user experience for the previous seven days to see if consumers experience acceptable (or, more importantly, unacceptable) response times.

This area also shows trending, which indicates if the applications meet their performance service level objectives (SLO). You can view the previous week's minimum response time, the first quartile, the third quartile, and the maximum response time, with a median shown against an acceptable SLO, which you can configure. When the median response time for any application is out of the acceptable SLO range, an alert (solid red circle) appears next to the application. You can click an application to display the asset page summarizing the current state of that resource.

### Storage Tiers Daily Performance

This component shows a summary of the tier's performance for response time and IOPS for the previous seven days. This performance is compared against a SLO, which you can configure, enabling you to see if there is opportunity to consolidate tiers, realign workloads delivered from those tiers, or identify issues with particular tiers. When median response time or median IOPS is out of the acceptable SLO range, an alert (solid red circle) appears next to a tier.

You can click a tier name to display the Storage Pools Capacity and Performance Details report, which shows free versus used capacities, number of days to full, and performance (IOPS and response time) details for all the pools in the selected tier. Click any storage or storage pool in this report to display the asset page summarizing the current state of that resource.

### Orphaned Capacity

This component shows the total orphaned capacity and orphaned capacity by tier, comparing it against acceptable ranges for total usable capacity and showing the actual capacity that is orphaned. Orphaned capacity is defined by configuration and by performance. *Storage orphaned by configuration* describes a situation in which there is storage allocated to a host. However, the configuration has not been performed properly and the host cannot access the storage. *Orphaned by performance* is when the storage is correctly configured to be accessed by a host. However, there has been no storage traffic.

The horizontal stacked bar shows the acceptable ranges. The darker the gray, the more unacceptable the situation is. The actual situation is shown with the narrow bronze bar that shows the actual capacity that is orphaned.

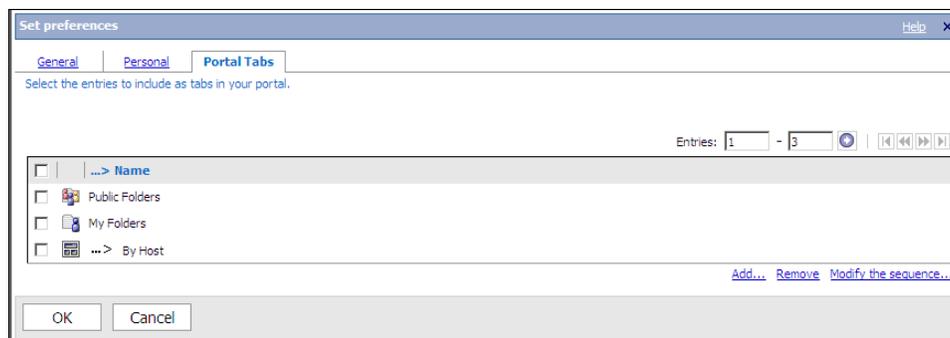
You can click a tier to display the Orphaned Storage Details report, which shows all the volumes identified as orphaned by configuration and performance for the selected tier. Click any storage, storage pool, or volume in this report to display the asset page summarizing the current state of that resource.

## Adding a dashboard from User Preferences

You might want to display a dashboard group of reports in a tab for easy access. You can add the tab from User Preferences.

### Steps

1. Open the OnCommand Insight Reporting Connection.
2. At the upper right, click the Person icon to show a drop-down menu.
3. Select **My Preferences**.
4. In the Set preferences view, click the **Portal Tabs** tab.



5. In the Portal Tabs tab, click the **Add** link.
6. In the Public Folders and Dashboard folder, locate the dashboard that you want as a tab and check it.
7. Click the arrow to move it to the Selected Entries box, and click **OK**.

## Using dashboards to survey information and display details

You can access report data through individual reports or by viewing that data in a group of report results on a dashboard.

### Steps

1. To display dashboards, open the OnCommand Insight Reporting Portal.
2. Select **Public Folders** and one of the report categories.
3. Select **Dashboards**.

The list that opens may contain reports, folders, and dashboards.

4. To open a dashboard, select an item in the list with the dashboard icon  beside it.

The dashboard might display immediately or require you to identify environment elements for the reports and submit your selections.

5. In the dashboard, click items in graphs to open more detailed versions of the reports for those specific items.

6. To display more information about data in report lists, click the links.
7. At the bottom of most dashboards is a list of report links. Click any of these links to generate additional reports.

**Related tasks**

[\*Managing dashboards\*](#) on page 14

## Creating custom ad hoc reports

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You can use the report authoring tools to create custom reports. After creating reports, you can save them and run them on a regular schedule. The results of reports can be automatically sent by email results to yourself and others.

The examples in this section show the following process, which can be used for any of the OnCommand Insight data models:

- Identifying a question to be answered with a report
- Determining the data needed to support the results
- Selecting data elements for the report

This section shows you how to create reports using different report authoring tools: Report Studio and Workspace Advanced.

### Report authoring tools

The OnCommand Insight enterprise reporting data models provide data elements and interactive relationships among data elements that yield business views of the data. Using the data elements and relationships, you can create reports using the Report Studio and Workspace Advanced which are report generation tools.

You can use the following report authoring tools to create reports with OnCommand Insight data models:

- With Report Studio, you can create reports with complex layout and formatting, and with filters, prompts, and conditions.
- With Workspace Advanced, you can create rich, interactive reports with a tool that has all the functionality of Report Studio and provides more advanced data exploration, such as adding additional measures, conditional formatting, and advanced calculations.

### What you need to do before you design your report

Before you design your custom report, you need to complete some prerequisite tasks. If you do not complete these, reports could be inaccurate or incomplete.

For example, if you do not finish the identification process, your capacity reports will not be accurate. Or, if you do not finish setting annotations (such as tiers, business units, and data centers), your custom reports will not show reports accurately across your domain and might show "N/A" for some data points.

Before you design your reports, complete the following tasks:

- Configure all data sources. For details, see the *OnCommand Insight Configuration and Administration Guide*.
- Identify all devices in your environment. For details, see the identification chapters in the *OnCommand Insight Inventory User Guide for the Java UI*.
- Enter annotations (such as tiers, data centers, and business units) on devices and resources in your environment. It is beneficial to have annotations stable before generating reports, because OnCommand Insight Data Warehouse collects historical information.

- Configure OnCommand Insight Data Warehouse to accept the data from the OnCommand Insight server in the Extract, Transform, and Load (ETL) process.

## Process of creating reports

The process of creating ad hoc reports involves several tasks.

- Plan the results of your report.
- Identify data to support your results.
- Select the data model (for example, Chargeback data model, Inventory data model, and so on) that contains the data.
- Select data elements for the report.
- Optionally format, sort, and filter report results.

## How to plan the results of your custom report

Before you open the Report Studio or Workspace Advanced report design tools, you might want to plan the results you want from the report. With these report authoring tools, you can create reports easily and might not need a great deal of planning; however, it is a good idea to get a sense from the report requestor about the report requirements.

- Identify the exact question you want to answer. For example:
  - How much capacity do I have left?
  - What are the chargeback costs per business unit?
  - What is the capacity by tier to ensure that business units are aligned at the proper tier of storage?
  - How can I forecast power and cooling requirements? (Add customized metadata by adding annotations to resources.)
- Identify the data elements that you need to support the answer.
- Identify the relationships between data that you want to see in the answer. Do not include illogical relationships in your question, for example, “I want to see the ports that relate to capacity.”
- Identify any calculations needed on data.
- Determine what types of filtering are needed to limit the results.
- Determine if you need to use current or historical data.
- Determine if you need to set access privileges on reports to limit the data to specific audiences.
- Identify how the report will be distributed. For example, should it be emailed on a set schedule, located on a dashboard, or included in a OnCommand Insight Reporting Connection My Folders area?
- Determine who will maintain the report. This might affect the complexity of the design.
- Create a mockup of the report.

## Tips for designing reports

Several tips might be helpful when you are designing reports.

- Determine whether you need to use current or historical data.

Most reports only need to report on the latest data available in the Data Warehouse.

- Data Warehouse provides historical information on capacity and performance, but not on inventory.
- Everybody sees all data; however, you might need to limit data to specific audiences. To segment the information for different users, you can create reports and set access permissions on them.

## Creating reports with Workspace Advanced

You can create custom reports using the Workspace Advanced report authoring tool.

### About this task

By following the example below, you can learn how to create your own customized reports using Cognos Workspace Advanced. For more examples of reports, visit the NetApp automation storefront.

### Related concepts

*[Where to find more information about OnCommand Insight](#) on page 6*

## Creating a sample report: Capacity Utilization by Data Center and Tier

You can create reports using Workspace Advanced. In this example, we will create a report using the “Storage and Storage Pool Capacity” data model, displaying the distribution of capacity by data center and tier.

### About this task

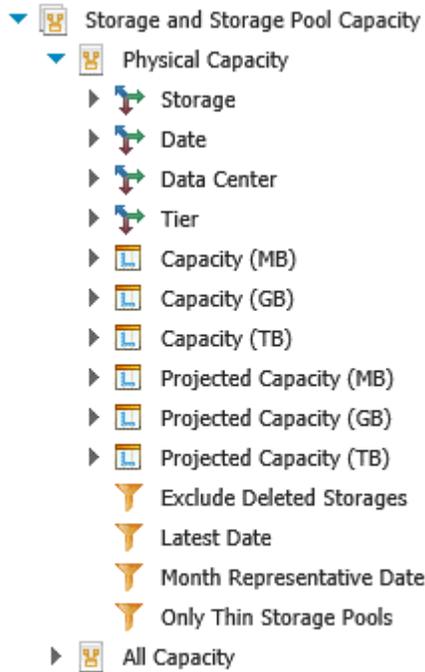
To create this report:

Data Center	Tier	Capacity (TB)	Used Capacity (TB)	Volume Capacity (TB)	Internal Volume Allocated Capacity (TB)
DC01	N/A	8,069.79	2,859.02	504.23	6,097.52
DC01	Tier 1	345.96	130.84	16.21	212.01
DC01	Tier 2	67.93	37.70	0.41	29.60
DC01	Tier 3	2,090.06	1,278.24	90.07	1,599.09
DC01	Tier 5	23.48	12.44	0.00	0.53
DC02	N/A	284.34	147.32	0.68	2.05
DC02	Tier 1	382.80	53.59	5.07	45.02
DC02	Tier 3	573.35	248.59	0.00	0.49
DC03	N/A	489.39	176.14	4.99	243.81
DC04	N/A	432.18	175.47	189.90	646.69
DC04	spB	87.31	49.72	0.58	69.60
DC04	Tier 2	27.55	16.89	0.20	27.23
DC06	N/A	7,561.70	3,122.81	1,975.95	7,058.44
DC06	Tier 1	2,427.28	1,305.63	1,932.93	8,900.40
DC06	Tier 2	66.30	31.56	3.27	79.62
DC06	Tier 3	2,005.19	1,130.00	62.53	1,863.93
DC08	N/A	96.04	54.55	12.11	116.36
DC10	N/A	107.69	57.18	15.35	121.30
DC14	N/A	14,413.48	7,605.56	5,001.39	13,789.08
DC14	Tier 3	418.02	163.16	11.54	174.76
DC56	N/A	76.48	18.27	11.30	29.26
N/A	N/A	5,022.36	1,761.24	858.73	3,023.86
N/A	Tier 1	597.27	247.67	24.59	460.48
N/A	Tier 3	1,474.40	546.08	21.53	693.80
N/A	Tier 4	21.82	8.77	0.00	10.02

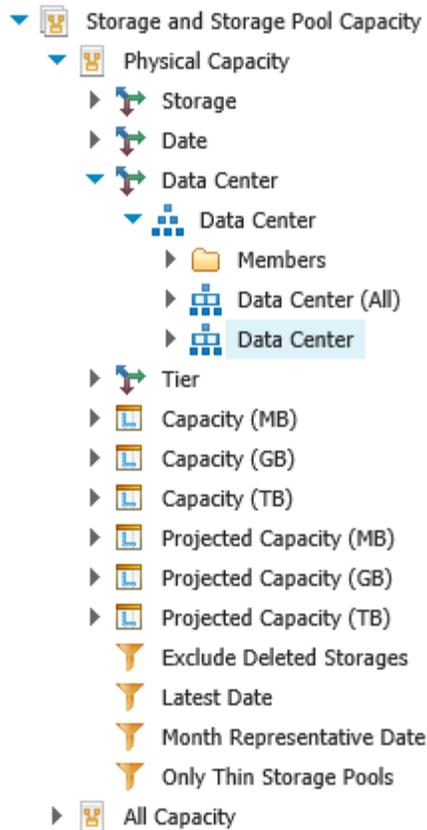
Follow these steps:

### Steps

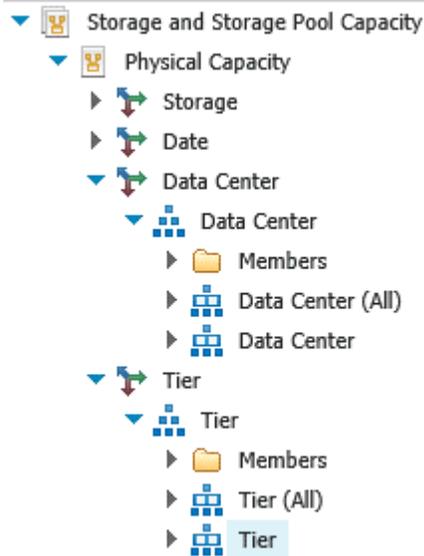
1. Access the OnCommand Insight Reporting Portal.
2. From the Launch menu (upper right corner), select Cognos Workspace Advanced.
3. From the list of packages in the Packages folder, select Storage and Storage Pool Capacity.
4. On the Cognos Workspace Advanced landing page, select **Create New**.
5. From the pre-defined report layouts, choose **List** and click OK.
6. Expand the Physical Capacity from the Storage and Storage Pool Capacity package:



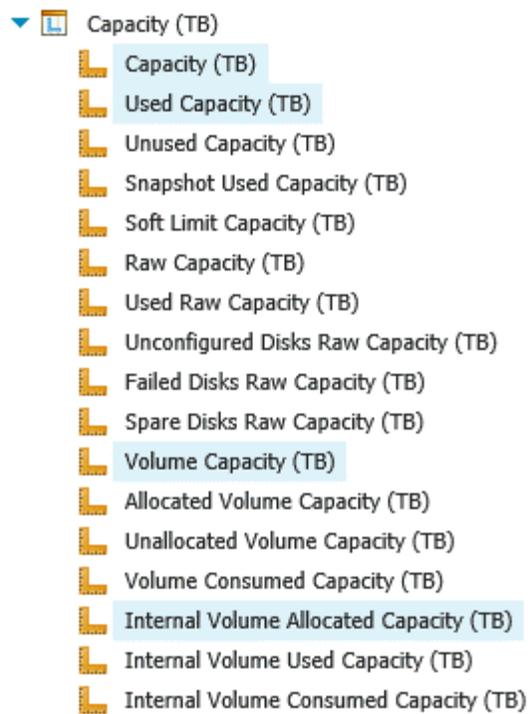
7. Expand Data Center and drag Data Center into the list:



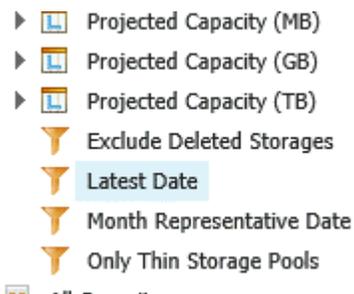
8. Expand Tier and drag Tier into the list besides Data Center:



- Expand Capacity (TB) and drag in Capacity (TB), Used Capacity (TB), Volume Capacity (TB), Internal Volume Allocated Capacity (TB) into the list:



- To filter on the latest data, drag in Latest Date into the list:



11. Rename the title of the report and save.

## Importing and exporting report definitions in Report Studio

In OnCommand Insight Reporting, the Report Studio application provides an easy method for importing and exporting report definitions in an XML format.

This allows you to add new reports posted in NetApp forums to your OnCommand Insight Reporting installation. In addition, this feature is useful to back up report definitions and exchange reports with colleagues.

To create these reports, you must have a license for the OnCommand Insight Plan module.

You do not have to specify a package when importing XML. The package is specified as part of the XML.

## Reporting data model

Your enterprise can benefit from the data that is discovered and stored in OnCommand Insight Data Warehouse. The OnCommand Insight Data Warehouse is a centralized repository that stores data from multiple information sources and transforms them into a common, multidimensional data model for efficient querying and analysis.

From this repository, you can generate custom reports such as chargeback, consumption analysis, and forecasting reports that answer questions such as the following:

- What inventory do I have?
- Where is my inventory?
- Who is using our assets?
- What is the chargeback for allocated storage for a business unit?
- How much headroom do I have on switch ports?
- How long until I need to acquire additional storage capacity?
- Are business units aligned along the proper storage tiers?
- How is storage allocation changing over a month, quarter, or year?

Using the data model provided with OnCommand Insight Reporting, you can use report authoring tools, such as Report Studio and Workspace Advanced, to design and schedule reports. You can access the report authoring tools from the OnCommand Insight Reporting portal.

## Data model overview

OnCommand Insight provides several data models for use in report development. Each data model is an aggregation that summarizes data so that it can be queried and searched. For example, reports about capacity planning use the Capacity data model.

The OnCommand Insight enterprise reporting data models provide data elements and interactive relationships among data elements that yield business views of the data. Using the data elements and relationships, you can create reports using Report Studio and Workspace Advanced, the report generation tools recommended by NetApp.

OnCommand Insight also provides data marts that can be used to develop your own SQL queries. There is a distinction between these SQL query data marts and the data models used in reporting. The individual OnCommand Insight reporting data models use the underlying OnCommand Insight database schema provided in the data marts; however, the data models use additional tables and

sometimes new elements in the tables. For instance, the data model includes a Monthly Capacity Fact table in the Storage Capacity data model that is based on the Capacity Fact table from the database schema and data mart. The data model filters out the values from the database schema table to show only month information.

Another example of a difference between the database schema used in data marts and the data model is in the Violation table and the Violation Type column. The data model translates programmatic-named values in the database to match the text displayed in the OnCommand Insight Client.

## OnCommand Insight data models

OnCommand Insight includes several data models from which you can either select predefined reports or create your own custom report.

Each data model contains a simple data mart and an advanced data mart:

- Simple data mart provides quick access to the most commonly used data elements and includes only the last snapshot of Data Warehouse data; it does not include historical data.
- Advanced data mart provides all values and details available from the simple data mart and includes access to historical data values.

### Capacity data model

Enables you to answer questions about storage capacity, file system utilization, internal volume capacity, port capacity, qtree capacity, and virtual machine (VM) capacity. The Capacity data model is a container for several capacity data models.

#### Storage and Storage Pool Capacity data model

Enables you to answer questions about storage capacity resource planning, including storage and storage pools, and includes both physical and virtual storage pool data. This simple data model can help you answer questions related to capacity on the floor and the capacity usage of storage pools by tier and data center over time.

If you are new to capacity reporting, you should start with this data model because it is a simpler, targeted data model.

#### File System Utilization data model

Enables you to answer questions about file system utilization. This data model provides visibility about capacity utilization by hosts at the file system level. Administrators can determine allocated and used capacity per file system, determine the type of file system, and identify trending statistics by file system type.

#### Internal Volume Capacity data model

Enables you to answer questions about internal volume used capacity, allocated capacity, and capacity usage over time.

#### Port Capacity data model

Enables you to answer questions about switch port connectivity, port status, and port speed over time. This data can be used when planning for the purchase of new SAN switches.

#### Qtree Capacity data model

Enables you to trend qtree utilization (with data such as used versus allocated capacity) over time. You can view the information by different dimensions—for example, by business entity, application, tier, and service level.

#### VM Capacity data model

Enables you to report your virtual environment and its capacity usage. This data model lets you report on changes in capacity usage over time for VMs and data stores. The data model also provides thin provisioning and virtual machine chargeback data.

**Volume Capacity data model**

Enables you to analyze all aspects of the volumes in your environment and organize data by vendor, model, tier, service level, and data center. You can view the capacity related to orphaned volumes, unused volumes, and protection volumes (used for replication). You can also see different volume technologies (iSCSI or FC), and compare virtual volumes to non-virtual volumes for array virtualization issues.

**Chargeback data model**

Enables you to answer questions about used capacity and allocated capacity on storage resources (volumes, internal volumes, and qtrees). This data model provides storage capacity chargeback and accountability information by hosts, application, and business entities, and includes both current and historical data. Report data can be categorized by service level and storage tier.

You can use this data model to generate chargeback reports by finding the amount of capacity that is used by a business entity. This data model enables you to create unified reporting of multiple protocols (including NAS, SAN, FC, and iSCSI).

- For storage without internal volumes, chargeback reports show chargeback by volumes.
- For storage with internal volumes:
  - If business entities are assigned to volumes, chargeback reports show chargeback by volumes.
  - If business entities are not assigned to volumes but assigned to qtrees, chargeback reports show chargeback by qtrees.
  - If business entities are not assigned to volumes and not assigned to qtrees, chargeback reports show the internal volume.
  - The decision whether to show chargeback by volume, qtree or internal volume is made per each internal volume, so it is possible for different internal volumes in the same storage pool to show chargeback at different level.

Capacity facts are purged after a default time interval. For details, see Data Warehouse processes.

Reports using the Chargeback data model might display different values than those reports using the Storage Capacity data model.

- For storage arrays that are not NetApp storage systems, the data from both data models is the same.
- For NetApp and Celerra storage systems, the Chargeback data model uses a single layer (of volumes, internal volumes, or qtrees) to base its charges, while the Storage Capacity data model uses multiple layers (of volumes and internal volumes) to base its charges.

**Inventory data model**

Enables you to answer questions about inventory resources including hosts, storage systems, switches, disks, tapes, qtrees, quotas, virtual machines and servers, and generic devices. The Inventory data model includes several submarts that enable you to view information about replications, FC paths, iSCSI paths, NFS paths, and violations. The Inventory data model does not include historical data.

**Performance data model**

Enables you to answer questions about performance for volumes, application volumes, internal volumes, switches, applications, VMs, VMDKs, ESX versus VM, hosts, and application nodes.

The Performance data model includes information that helps you determine the appropriateness of tiers, storage misconfigurations for applications, and last access times of volumes and internal volumes. This data model provides data such as response times, IOPs, throughput, number of writes pending, and accessed status.

### **Storage Efficiency data model**

Enables you to track the storage efficiency score and potential over time. This data model stores measurements of not only the provisioned capacity, but also the amount that is used or consumed (the physical measurement). For example, when thin provisioning is enabled, OnCommand Insight indicates how much capacity is taken from the device. You can also use this model to determine efficiency when deduplication is enabled.

### **Data model fact and dimension tables**

Each data model includes both fact and dimension tables.

- **Fact tables:** Contain data that is measured, for example, quantity, raw and usable capacity. Contain foreign keys to dimension tables.
- **Dimension tables:** Contain descriptive information about facts, for example, data center and business units. A dimension is a structure, often composed of hierarchies, that categorizes data. Dimensional attributes help describe the dimensional values.

Using different or multiple dimension attributes (seen as columns in the reports), you construct reports that access data for each dimension described in the data model.

For explanations of all data elements used in creating reports, see the Data Glossary.

### **Colors used in data model elements**

Colors on data model elements have different indications.

- **Yellow assets:** Represent measurements.
- **Non-yellow assets:** Represent attributes. These values do not aggregate.

### **Using multiple data models in one report**

Typically, you use one data model per report. However, you can write a report that combines data from multiple data models.

To write a report that contains only one data model, choose the data model and use one of two report authoring tools, Report Studio or Workspace Advanced.

To write a report that combines data from multiple data models, choose one of the data models to use as the base, then write SQL queries to access the data from the additional data marts. You can use the SQL Join feature to combine the data from the different queries into a single query that you can use to write the report.

For example, say you want the current capacity for each storage array and you want to capture custom annotations on the arrays. You could create the report using the Storage Capacity data model. You could use the elements from the Current Capacity and dimension tables and add a separate SQL query to access the annotations information in the Inventory data model. Finally, you could combine the data by linking the Inventory storage data to the Storage Dimension table using the storage name and the join criteria.

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