Welcome to OnCommand Insight Data Warehouse

OnCommand Insight

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Welcome to OnCommand Insight Data Warehouse

The OnCommand Insight Data Warehouse is a centralized repository that stores data from multiple OnCommand Insight servers and transforms data into a common, multidimensional data model for querying and analysis.

The OnCommand Insight Data Warehouse enables access to an open database consisting of several data marts that let you generate custom capacity and performance reports such as chargeback reports, trending reports with historical data, consumption analyses, and forecasting reports.

Data Warehouse features

The OnCommand Insight Data Warehouse is an independent database made up of several data marts.

Data Warehouse includes the following features:

- Current and historical configuration and inventory data that enables you to create trending reports useful for forecasting and planning
- Several multidimensional historical data marts and an additional current-only inventory data mart
- An optimized database for predefined queries or user-defined queries
- A platform for integration with third-party reporting and business intelligence engines, including:
  - Configuration management databases
  - Financial accounting systems
  - Asset management systems

Data Warehouse components

Data Warehouse contains several components.

- Data Warehouse Portal
- OnCommand Insight Reporting Portal
- Report authoring tools

What you can do using the Data Warehouse Portal

The Data Warehouse Portal is a web-based user interface that you use to configure options and set up fixed schedules to retrieve data. From the Data Warehouse Portal, you can also access the OnCommand Insight reporting portal.

Using Data Warehouse portal, you can do the following:

- Access the OnCommand Insight reporting portal to view predesigned reports or to create custom reports using report authoring tools.

- Consolidate multiple OnCommand Insight databases.
- Manage connections to OnCommand Insight servers.
- Check the status of current jobs or queries that are running.
- Schedule Data Warehouse builds.
- Edit the site name.
- View Data Warehouse version and upgrade history, including specific information such as module versions, sites, and licenses.
- Import annotations.
- Configure a build from history.
- View Data Warehouse documentation and the database schema.
- Reset the Data Warehouse database.
- Back up and restore the Data Warehouse database.
- Troubleshoot Data Warehouse issues.
- Manage user accounts.

Data Warehouse software components

OnCommand Insight Data Warehouse includes several software components.

- MySQL database

  The back-end repository for data mart tables

- IBM Cognos

  The reporting engine for OnCommand Insight

- Apache Derby Database

  Used for storing Cognos configuration and content

- WildFly

  The Java Enterprise application server that hosts OnCommand Insight components

Data Warehouse processes

Data Warehouse performs many types of processes.

- **ETL process**

  The Extract Transform and Load (ETL) process retrieves data from multiple OnCommand Insight databases, transforms the data, and saves it into the data mart. The Data Warehouse build process is an ETL process.

- **Jobs**

  Data Warehouse performs and reports on jobs such as these: inventory, dimensions, capacity, port

capacity, VM capacity, file system utilization, performance, capacity efficiency, licenses, history build, dynamic annotations, connector removal, skipped build, ASUP option, and maintenance jobs.

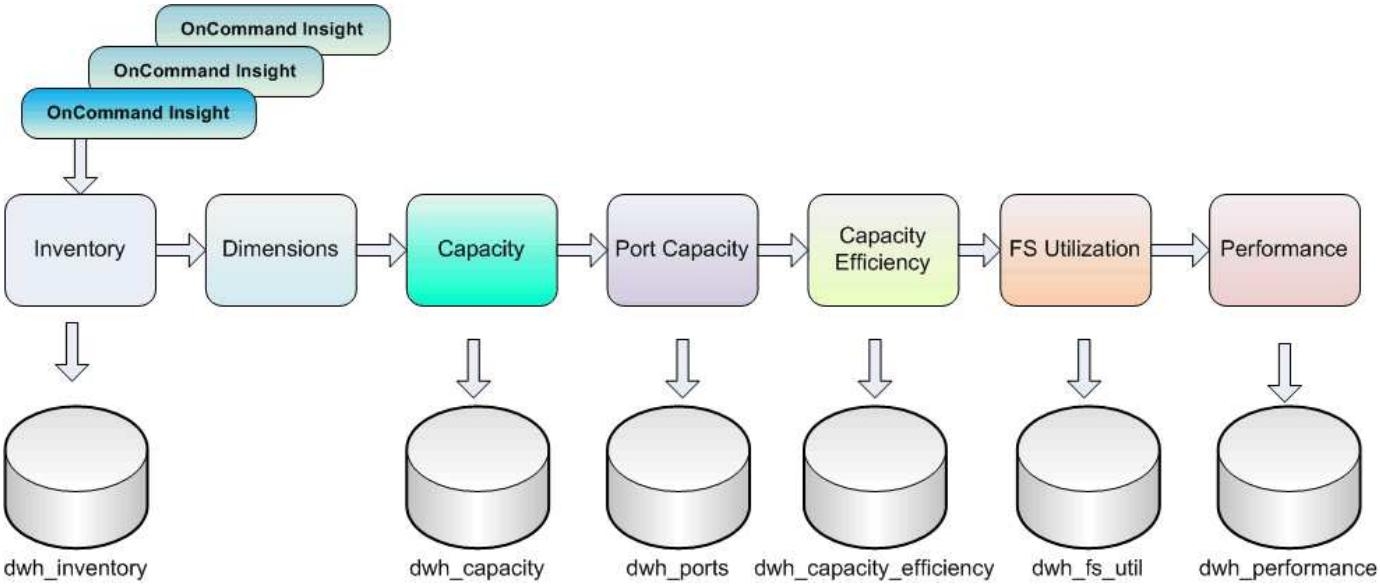
- **Consolidation process**

  Data Warehouse supports the consolidation of multiple OnCommand Insight servers into the same Data Warehouse database. In many configurations it might happen that the same object is reported from multiple connectors (that is, the same switch exists in two OnCommand Insight instances). In that case, Data Warehouse consolidates the multiple objects into one (a primary connector is chosen and the object's data is taken from that connector only).

How Data Warehouse extracts data

The Extract, Transform, and Load (ETL) process retrieves data from multiple OnCommand Insight databases, transforms the data, and saves it into the data marts.

OnCommand Insight connectors invoke a series of batch jobs to extract data from multiple OnCommand Insight mySQL databases and publish the data in various data marts, as shown in the following diagram.



The ETL process includes these individual processes:

- **Extract**

  This process takes data from multiple OnCommand Insight databases, transforms the data, and saves it into the data mart. The process is performed against each OnCommand Insight instance at the same time. To ensure that data cleansing and deduplication is performed, it is not possible to split the ETL process into multiple scheduled ETL operations.

- **Transform**

  This process applies business logic rules or functions to extract the data from the OnCommand Insight database.

- **Load**

  This process loads the transformed data into public data marts.

ETL frequency and date data

You should run the Extract, Transform, and Load (ETL) process at least once per day; however, you choose to run ETL numerous times if needed.

By default, the Cognos reporting engine treats all capacity and performance facts as additive. As a result, there is a risk of double counting capacity data if the ETL process is run multiple times per day without the proper time filters.

Two date data elements in the Date dimension are related to the daily ETL process. The Date dimension, which is used in several data models, includes the following data elements that are affected by the ETL:

- **Is Day Representative**

  The "Is Day Representative" data element is set to a value of 1 (true) during the first ETL process run during any given day. If the first ETL process is run at 1:00 a.m., Is Day Representative is set to 1 for all of the data loaded during the 1:00 a.m. ETL process. If a second ETL is scheduled later (for example, 1:00 p.m.), Is Day Representative is set to 0 (false) for the data loaded during that ETL process.

- **Is Latest**

  The "Is Latest" member is set to a value of 1 (true) after each ETL process completes. If the first ETL process is run at 1:00 a.m., Is Latest is set to 1 for all of the data loaded during the 1:00 a.m. ETL process. If another ETL process is scheduled later (for example, 1:00 p.m.), Is Latest is set to 1 for data loaded during the 1 p.m. ETL process. The ETL process also sets the 1:00 a.m. ETL load's Is Latest entry to 0 (false).

How historical data is retained in Data Warehouse

Data is maintained in Data Warehouse according to a schedule. As data gets older, the data record retention is reduced.

Data Warehouse retains historical data based on the data marts and granularity of the data, as shown in the following table.

Data mart	Measured object	Granularity	Retention period
Performance marts	Volumes and internal volumes	Hourly	14 days
Performance marts	Volumes and internal volumes	Daily	13 months
Performance marts	Application	Hourly	13 months
Performance marts	Host	Hourly	13 months
Performance marts	Switch performance for port	Hourly	5 weeks

Performance marts	Switch performance for host, storage, and tape	Hourly	13 months
Performance marts	Storage node	Hourly	14 days
Performance marts	Storage node	Daily	13 months
Performance marts	VM performance	Hourly	14 days
Performance marts	VM performance	Daily	13 months
Performance marts	Hypervisor performance	Hourly	14 days
Performance marts	Hypervisor performance	Daily	13 months
Performance marts	VMDK performance	Hourly	14 days
Performance marts	VMDK performance	Daily	13 months
Performance marts	Disk performance	Hourly	14 days
Performance marts	Disk performance	Daily	13 months
Capacity marts	All (except individual volumes)	Daily	13 months
Capacity marts	All (except individual volumes)	Monthly representative	14 months and beyond
Inventory marts	Individual volumes	Current state	1 day (or until next ETL)

After 13 months (which is configurable), Data Warehouse retains only one record per month instead of one record per day for capacity, performance, and resource data in the following fact tables:

- Chargeback fact table (dwh_capacity.chargeback_fact)
- File System Utilization fact table (dwh_fs_util.fs_util_fact)
- Host fact table (dwh_sa.sa_host_fact)
- Internal Volume Capacity fact table (dwh_capacity.internal_volume_capacity_fact)
- Ports fact table (dwh_ports.ports_fact)
- Qtree Capacity fact table (dwh_capacity.qtree_capacity_fact)
- Storage and Storage Pool Capacity fact table (dwh_capacity.storage_and_storage_pool_capacity_fact)
- Volume Capacity fact table (dwh_capacity.vm_capacity_fact)
- Storage Node Hourly Performance (storage_node_hourly_performance_fact) and Storage Node Daily Performance (storage_node_daily_performance_fact) fact tables

Data retention, ETL, and time periods

OnCommand Insight Data Warehouse retains data obtained from the Extract, Transform, and Load (ETL) process for different time periods based on the different data marts and time granularity of the data.

Performance Marts and hourly granularity for volumes and internal volumes

The OnCommand Insight Data Warehouse records the hourly averages, hourly maximums, and access bit for each hour of the day (24 data points) for 14 days. The access bit is a Boolean value that is true if the volume is accessed or false if the volume is not accessed during the hourly interval. All 24 data points for the preceding day are obtained during the first ETL process of the day.

You do not need to run one ETL process per hour to gather the hourly data points. Running additional ETL processes during the day does not obtain any performance information from the OnCommand Insight Servers.

Performance Marts and daily granularity for volumes and internal volumes

Each day when the ETL is processed, the daily averages for the preceding day are calculated and populated within Data Warehouse. The daily average is a summary of the 24 data points for the previous day. The performance data marts retain daily summaries for volumes and internal volumes for 13 months.

Capacity marts and daily granularity

The Capacity marts provide daily measurements for various capacity facts on a daily basis for a period of 13 months. The capacity facts in Data Warehouse are current as of the last data source acquisition for the device prior to the ETL.

Capacity marts and monthly granularity

Data Warehouse retains daily capacity data for 13 months. After the 13-month threshold is reached, the capacity data is summarized on a monthly basis. The monthly data is based on the values reflected by the date that is the month representative date.

The following table shows which monthly data is included in the monthly summary:

Date	Is Month Representative value	Allocated capacity
Jan 1	1 (True)	50 TB
Jan 2	0 (False)	52 TB
…	…	…
Jan 31	0 (False)	65 TB
Feb 1	1 (True)	65 TB

Based on the table, a monthly report would show 50 TB allocated for January and 65 TB allocated for February. All of the other capacity values for January would not be included in the monthly summary.

Inventory mart

The Inventory data mart is not historical. Each time an ETL process is run, the Inventory mart is erased and rebuilt. Therefore, any reports generated out of the Inventory mart do not reflect historical inventory configuration.

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