

Dell Acceleration Appliance for Databases 2.0

Monitoring Guide



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About this guide

This guide contains information about the different ways to monitor the status and performance of the Dell Acceleration Appliance for Databases (DAAD). This guide is intended for administrators responsible for server and storage systems. It is assumed the reader is familiar with basic server administration.

Typographical conventions

This document follows these conventions:

Convention	Usage	Examples
NOTE:	Important additional information or further explanation of a topic.	NOTE: A weekly backup is recommended.
CAUTION!	The task or operation might have serious consequences if conducted incorrectly or without appropriate safeguards. If you are not an expert in the use of this product, consult support for assistance.	CAUTION! Do not change configuration parameters.
Bold	A command or system input that you type, or text or a button you click on a graphical user interface (GUI).	Click Help for details about disaster recovery.
<i>Italic</i>	Italic font indicates any of the following: <ul style="list-style-type: none">• A term with a specific meaning in the context of this document.• Emphasis on specific information.• Reference to another document.• Variables in a syntax statement for which values are substituted.	Detailed information about disaster recovery methods is available in the Administrator Guide. <code>network:ping <i>hostname</i></code>
Courier	System output, file names or path names. Bold Courier for commands typed by user.	> Recovery in progress network:ping 10.1.100.14
< > Angle Brackets	A required entry or variable parameter	installer-<version#>.run
Square [] Brackets	An optional entry or variable parameter.	tar [zxvf] file.tgz
Curly { } Brackets	A list of options separated by a the pipe symbol " " from which any one must be selected.	Click { OK Cancel }.

Monitoring DAAD

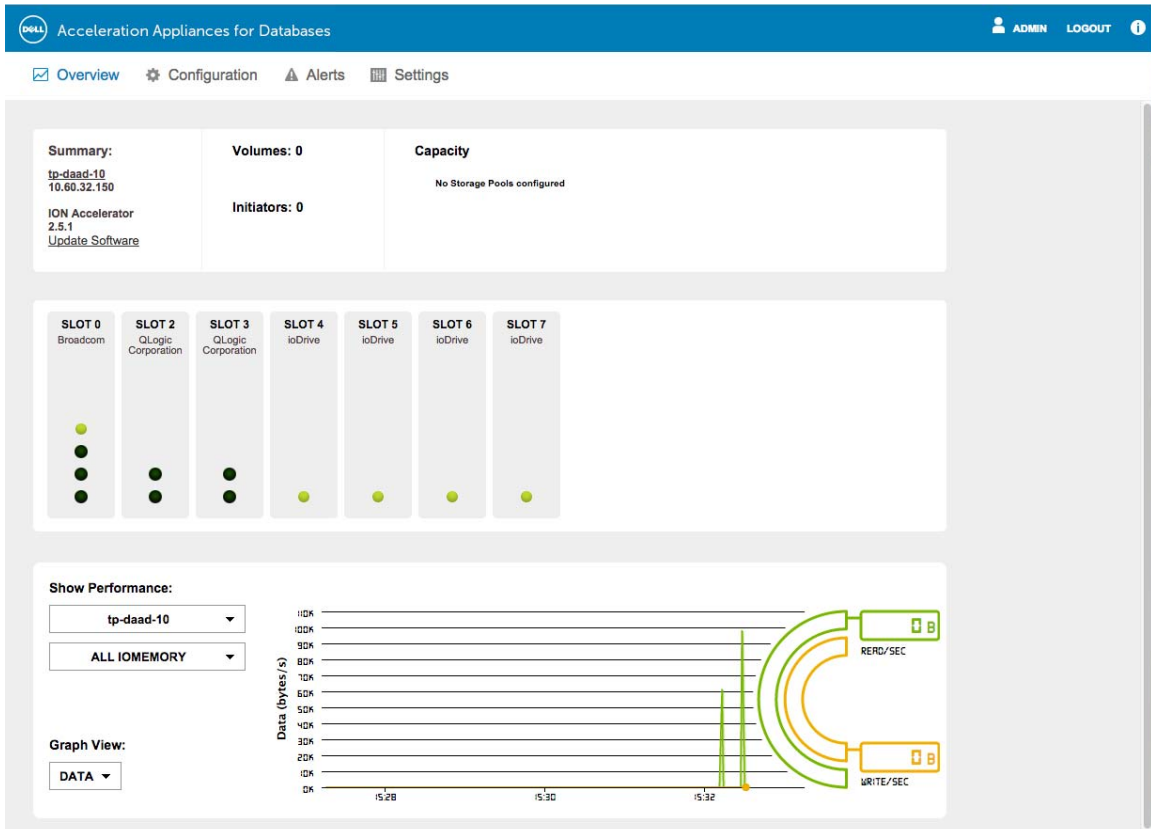
There are three graphical user interfaces (GUIs) that enable you to monitor the activity and performance of the Dell Acceleration Appliance for Databases:

- Dell Acceleration Appliance for Databases web interface
- Oracle Enterprise Manager (OEM)
- Ganglia

The DAAD web interface

The Dell Acceleration Appliance for Databases web interface is a GUI that can be accessed from a URL on the appliance. This URL is displayed on the console after initial configuration is complete, and is generally the hostname of the appliance or its IP address.

For information about accessing the Dell Acceleration Appliance for Databases, see the *Dell Acceleration Appliance for Databases GUI Guide*.



Oracle Enterprise Manager

Oracle Enterprise Manager (OEM, 12c Cloud Control) is an Oracle management suite that allows the database administrator to manage and monitor all aspects of both Oracle and non-Oracle targets.

For more information, see [About the Oracle Enterprise Manager plug-in](#) on page 11 and the subsequent chapters on installing and using the application.

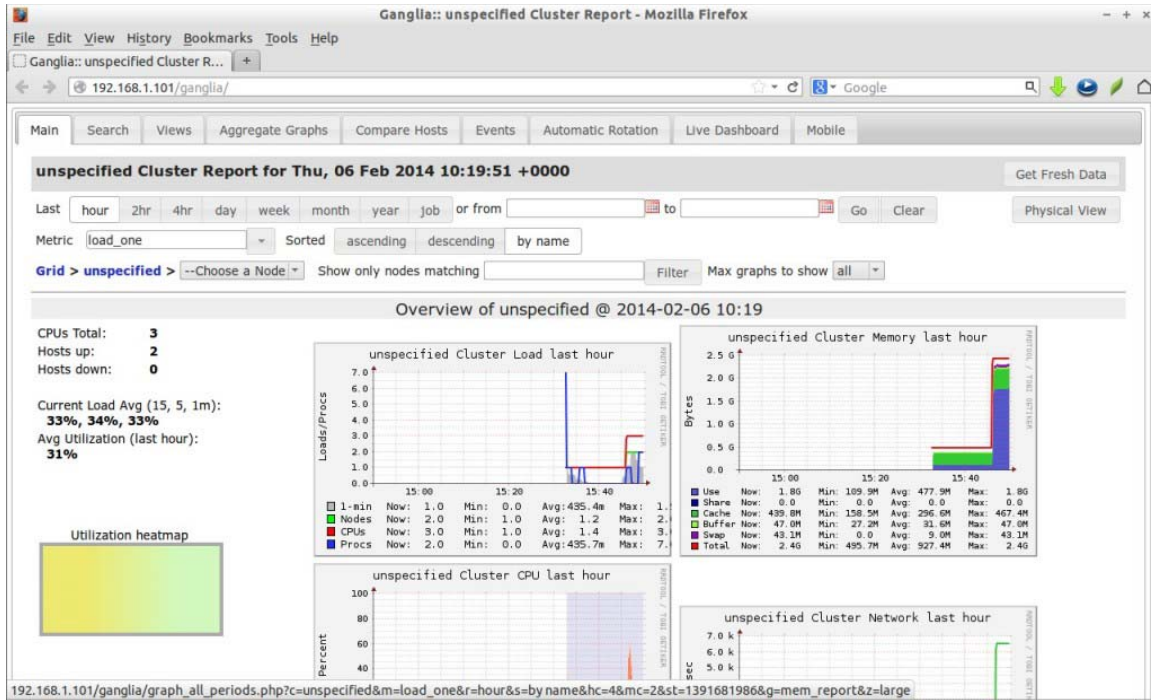
The screenshot displays the Oracle Enterprise Manager Cloud Control 12c interface for a SanDisk ION Data Accelerator xion 1 target. The dashboard includes several key components:

- Navigation Menu:** A sidebar on the left provides access to various management functions such as Home, Monitoring, Control, Job Activity, Information Publisher Reports, Performance MB, Performance IO, Pool Details, Configuration, Compliance, Target Setup, and Target Information.
- Incidents and Problems:** A section at the top right shows a table for monitoring alerts, currently displaying zero incidents.
- Utilization % (Last 24 hours):** A line chart showing the percentage of storage utilization over a 24-hour period, with values fluctuating between approximately 2.4% and 3.6%.
- ION Accelerator Performance (Last 24 hours):** A smaller line chart showing performance metrics over the same period.
- Summary of ION Accelerator Resource:** A pie chart indicating that 68.4% of the space is free and 31.6% is used.
- LUNs Table:** A table listing six LUNs with their respective volume IDs, capacities, and LUN IDs.

Export	Volume ID	Capacity (GB)	LUN ID	LUN
1	volume-1	100	ign.2007-02.com.fusionio:sn.cz1-	0
2	volume-2	45	ign.2007-02.com.fusionio:sn.cz1-	1
3	volume-3	114	ign.2007-02.com.fusionio:sn.cz1-	2
4	volume-4	22	ign.2007-02.com.fusionio:sn.cz1-	3
5	volume-5	80	ign.2007-02.com.fusionio:sn.cz1-	4
6	volume-6	400	ign.2007-02.com.fusionio:sn.cz1-	5

Ganglia

Ganglia is an open source monitoring application that can provide performance and status information about the Dell Acceleration Appliance for Databases by using www-based administration console. For more information, see [About Ganglia](#) on page 47 and the subsequent chapters on installing and using the interface.



About the Oracle Enterprise Manager plug-in

Oracle Enterprise Manager (OEM, 12c Cloud Control) is an Oracle management suite that allows the DBA to manage and monitor all aspects of both Oracle and non-Oracle targets. It is used extensively to tune overall performance by identifying bottlenecks in monitored targets. The Dell Acceleration Appliance for Databases plug-in for OEM enables OEM to display information and statistics, such as volume and link performance, directly from the storage array.

Version 12.1.0.1 of the plug-in is compatible with the following:

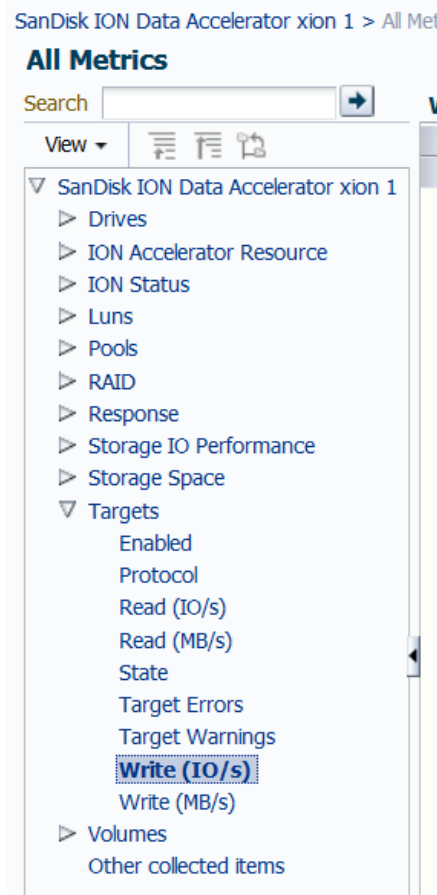
- ION Accelerator Agent v12.1.0.1
- Oracle Management Server (OMS) versions 12.1.0.1, 12.1.0.2, and 12.1.0.3

How it works

The plug-in operates according to the following basic process:

- 1 The plug-in defines the data to be requested from the ION Accelerator agent (included in the Dell Acceleration Appliance for Databases software).
- 2 The agent collects the data and sends it to OMS (Oracle Management Services).
- 3 OMS stores the data in the database repository.

4 The plug-in displays the data stored in OMS by using the OEM GUI.



What it captures

The plug-in can display a wide variety of information from the Dell Acceleration Appliance for Databases software. The example screen shot shows the All Metrics screen in OEM, with information categories from Dell Acceleration Appliance for Databases.

The default granularity for data gathering is five minutes, which can be configured by the user.

For examples of the pages and reports available with this plug-in, see [Using the OEM plug-in](#) on page 29.

Installing and configuring the OEM plug-in

Prerequisites

To install and configure the Dell Acceleration Appliance for Databases plug-in for OEM, certain prerequisites must be fulfilled.

DAAD requirements

- The Dell Acceleration Appliance for Databases software must be version 2.0 or above.
- The Ethernet connection in the Dell Acceleration Appliance for Databases must be assigned an IP address that is accessible by Oracle Management Server.
- The hostnames for both Dell Acceleration Appliance for Databases and OMS must be resolvable by DNS or `/etc/hosts`.

Compatibility guidelines

The following table shows the current compatibility matrix that has been tested. More OS types are supported than noted here, so the metrics will be qualified and updated as appropriate hereafter. The current certification matrix is available at <https://support.oracle.com>.

Table 3-1. DAAD Plug-in Version 12.1.0.1 Release 2.3.01

OEM Agent Version	OMS Version 12.1.0.1	OMS Version 12.1.0.2	OMS Version 12.1.0.3	OMS OS Tested
12.1.0.1	Yes	Yes	Yes	Win2008 R2 Win 2012 OEL 6.x RHEL 6.x SLES 11 SP3


Installing the plug-in with DAAD

The Dell Acceleration Appliance for Databases software contains the necessary Oracle agent. Complete the steps in this section to enable the custom OEM agent:

- 1 Log in to the command line interface (CLI) for DAAD as an admin user.
- 2 Run the following command to enable and configure the Oracle agent:

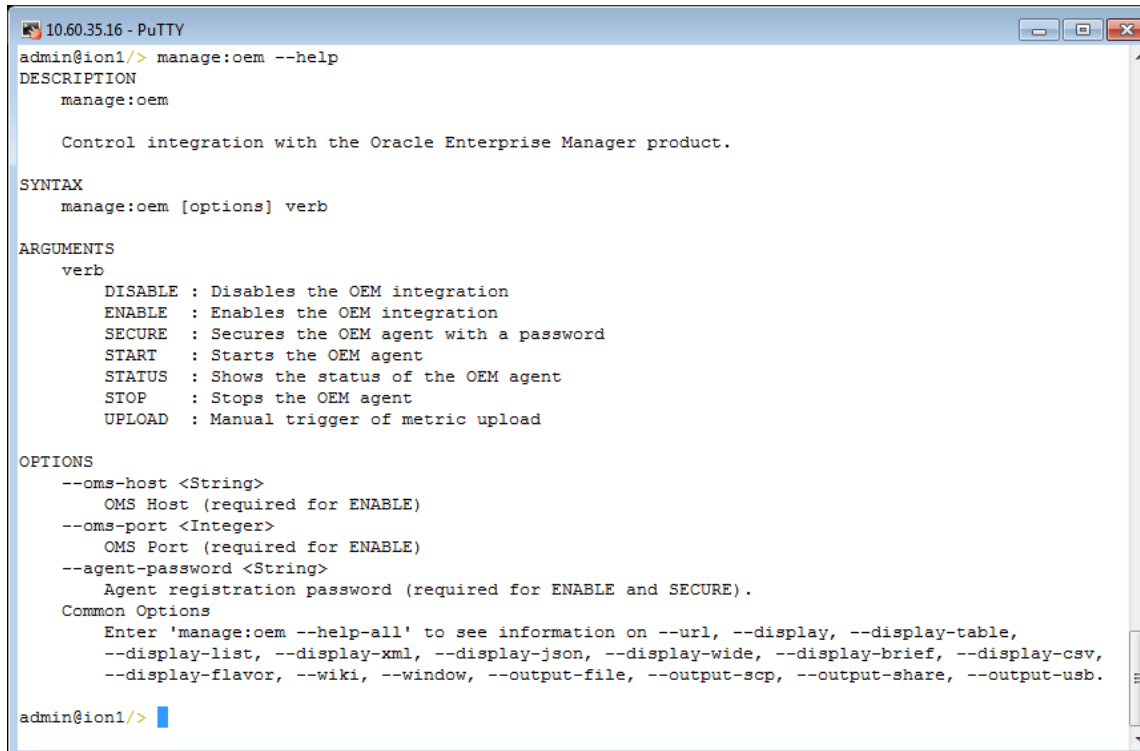
```
admin@ion-sm2/> manage:oem enable --oms-host=<oms_server_address> --oms-port=4904
```
- 3 Enter the Agent Registration password when the CLI prompts. (You may have to contact your OEM administrator for the password.)
- 4 After the installation completes, log in to the OEM console.

In OEM, the All Targets view shows the default target types as available (UP).

ion-sm2	Host	
ion-sm2:3872	Agent	

For more information about the `manage:oem` command and the Dell Acceleration Appliance for Databases command-line interface, see the *Dell Acceleration Appliance for Databases CLI Reference Guide*. [Figure 3-1](#) provides a summary of the `manage:oem` command.

Figure 3-1. Summary of manage:oem CLI command



```
10.60.35.16 - PuTTY
admin@ion1/> manage:oem --help
DESCRIPTION
  manage:oem

  Control integration with the Oracle Enterprise Manager product.

SYNTAX
  manage:oem [options] verb

ARGUMENTS
  verb
  DISABLE : Disables the OEM integration
  ENABLE  : Enables the OEM integration
  SECURE  : Secures the OEM agent with a password
  START   : Starts the OEM agent
  STATUS  : Shows the status of the OEM agent
  STOP    : Stops the OEM agent
  UPLOAD  : Manual trigger of metric upload

OPTIONS
  --oms-host <String>
    OMS Host (required for ENABLE)
  --oms-port <Integer>
    OMS Port (required for ENABLE)
  --agent-password <String>
    Agent registration password (required for ENABLE and SECURE).
  Common Options
  Enter 'manage:oem --help-all' to see information on --url, --display, --display-table,
  --display-list, --display-xml, --display-json, --display-wide, --display-brief, --display-csv,
  --display-flavor, --wiki, --window, --output-file, --output-scp, --output-share, --output-usb.

admin@ion1/>
```

Disabling the Oracle agent

If the agent install is unsuccessful, or is partially successful, you can remove the agent by entering the CLI command: `oem:disable`

Installing the plug-in with Oracle

Importing the plug-in

- 1 Log in to dell.com/support/home and download the ION Accelerator plug-in.
- 2 Copy the downloaded plug-in to a directory on the OMS host server.
- 3 Set up the Enterprise Manager Command Line (EM CLI) utility. From the Setup menu, click **Command Line Interface**. Follow the instructions outlined on the Enterprise Manager Command Line Interface Download page.

NOTE: EM CLI requires Java 1.6 or later.

- 4 Set up the software library by clicking **Setup > Provisioning and Patching > Software Library > Add**, and then provide a local file system for the library.

Deploying the plug-in

There are two ways you can deploy the plug-in:

- Deploy the plug-in to the server and agent
- Deploy the plug-in on the management server

Deploying the plug-in to the server and agent

NOTE: As an alternative, you can deploy the plug-in to the server and agent by using OMS.

- 1 Add `emcli` to the current path, or `cd` to the `emcli` installation directory.
- 2 Run the following commands:

```
./emcli import_update -file=/tmp/12.1.0.1.0_sandisk.ion.xion_2000_0.opar
-omslocal
./emcli deploy_plugin_on_server -plugin=sandisk.ion.xion
-sys_password=Password -repo_backup_taken
./emcli deploy_plugin_on_agent -agent_names=ion2.int.fusionio.com:3872
-plugin=sandisk.ion.xion
```

Deploying the plug-in on the management server

- 1 Log in to OEM as `sysman` (administrator) by using a web browser. For example, <https://192.168.2.65:7803/em/>

ORACLE Enterprise Manager Cloud Control 12c

12^c

Login

User Name

Password

Enterprise Manager Key Features

- ▼ Standardize and automate target lifecycle management
Discover targets, their configurations, and target relationships using Enterprise Manager's rich configuration management functionality. Define standards, detect drift and take action to manage ongoing compliance. Provision, Patch and Upgrade targets using a few mouse clicks.
- ▶ Automate Routine Tasks
- ▶ Stay ahead of the curve with My Oracle Support Integration
- ▶ Manage History as One with Groups
- ▶ Complete, Integrated, Application to Disk IT Management

New in this Release

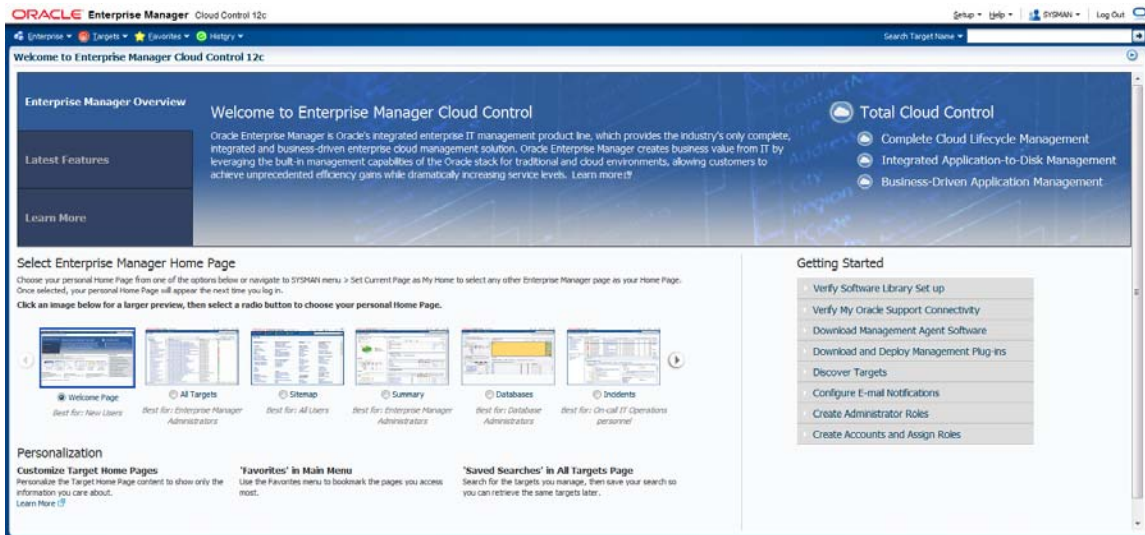
- ▼ Securely manage test data with data masking and data subsetting
Automatically discover data structure with application data models. Extract a subset of data to use during testing, and instantly mask sensitive data from packaged applications such as Oracle E-Business Suite, Siebel and Peoplesoft. Leverage built-in integration with third Application Testing for secure database testing.
- ▶ Identify root cause of failures with Middleware Diagnostic Advisor (MDA)
- ▶ Control configurations sprawl with configuration management
- ▶ Monitor and manage targets using lifecycle management
- ▶ Manage the Oracle WebLogic lifecycle

Did you know...

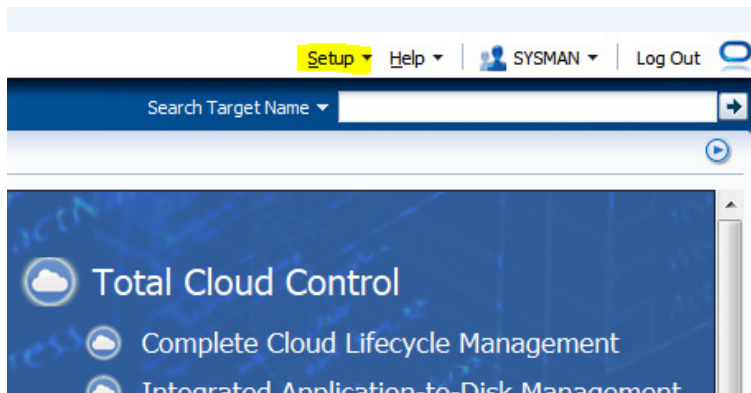
Oracle Application Testing Suite
Oracle brings massive efficiencies to application testing with Oracle Application Testing suite. Ensure the successful rollout of mission-critical packaged applications like e-Business Suite, Siebel, PeopleSoft, JD Edwards and Hyperion as well as new Fusion Applications and custom Web and SOA applications. Leverage Oracle's application-specific accelerators and Test Starter Kits to get to test results quickly.

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After login, the OEM homepage is displayed:

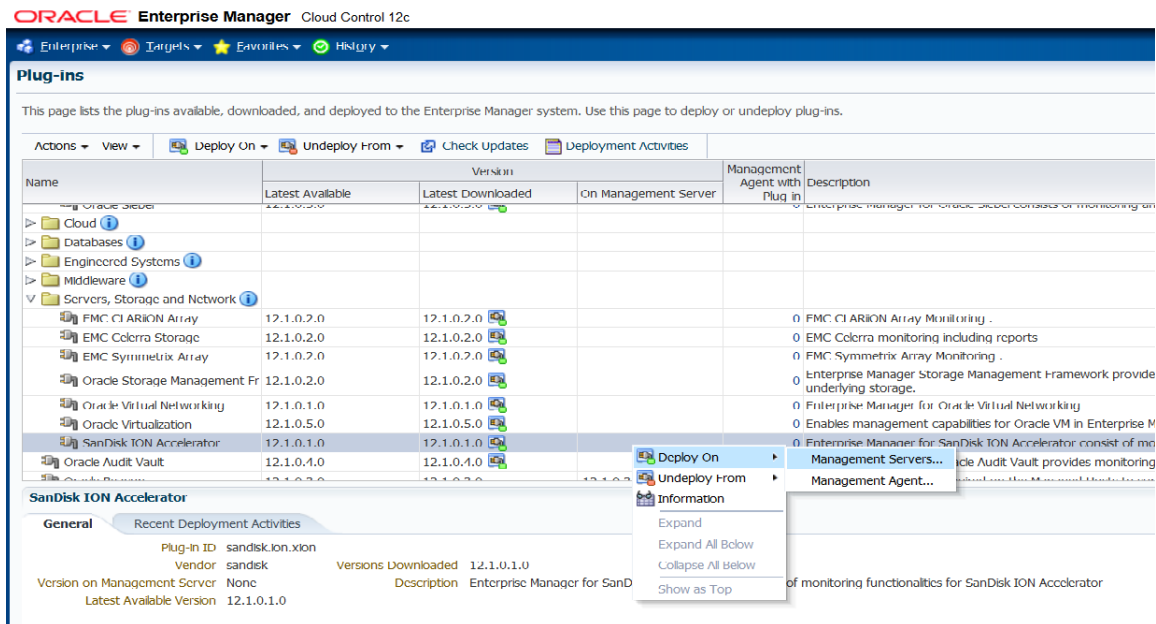


2 In the upper-right corner of the page, click **Setup > Extensibility > Plug-ins**



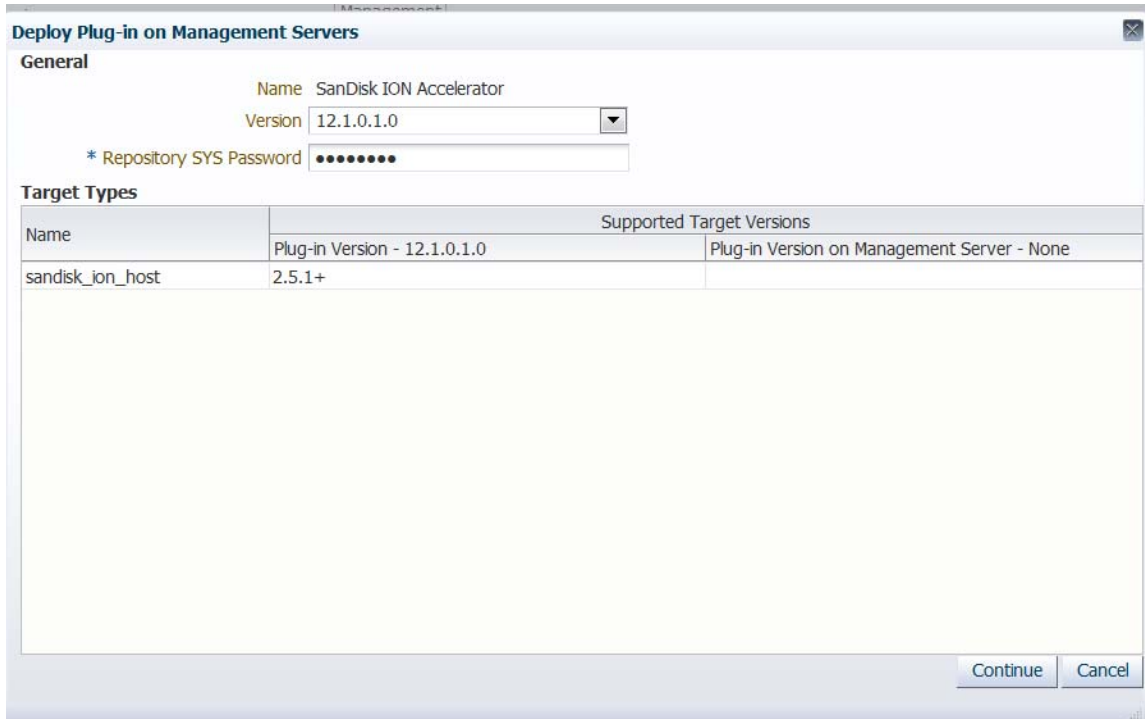
3 From the Plug-ins page, expand the Servers, Storage and Network folder.

4 Right-click **SanDisk ION Accelerator** and click **Deploy On > Management Servers**.



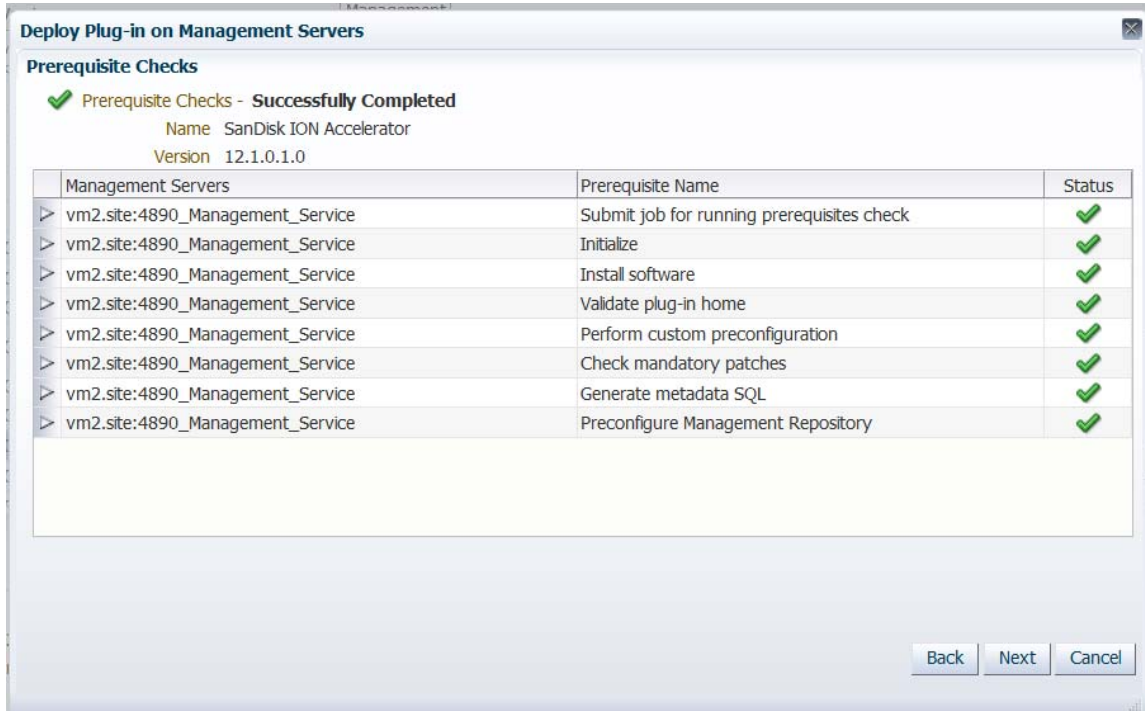
The Deploy Plug-in Management Servers wizard is displayed.

5 Enter the Repository SYS password to add the plug-in on OEM server.

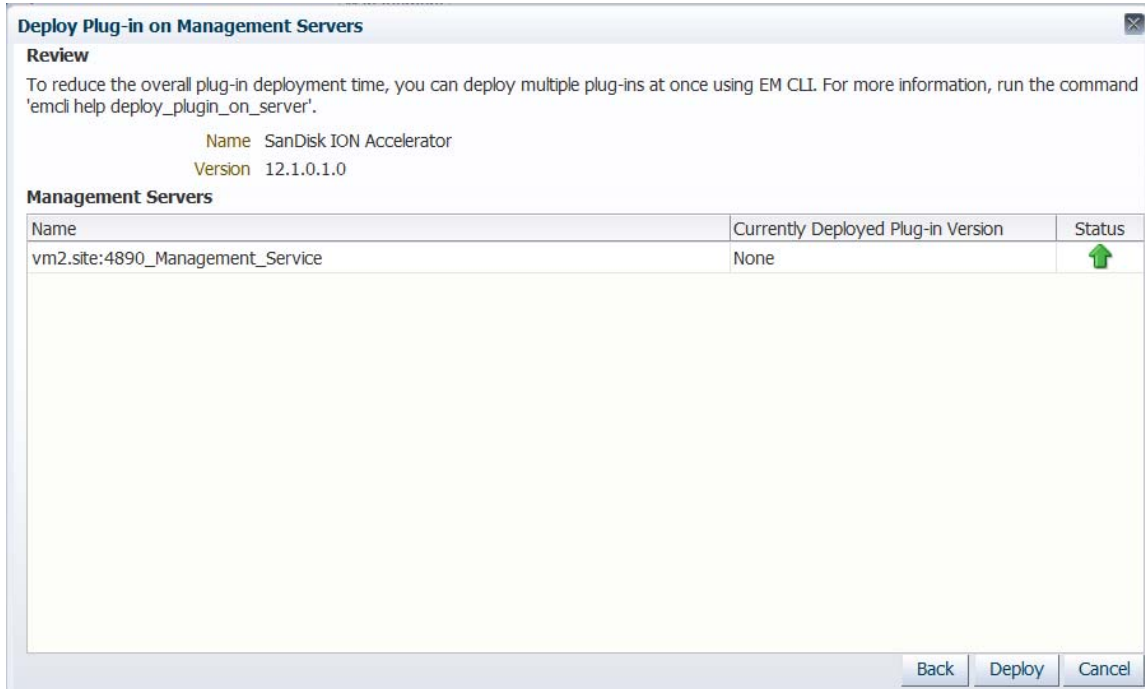


6 Click **Continue**.

- After the prerequisite checks are finished, click **Next** on the Prerequisite Checks screen.

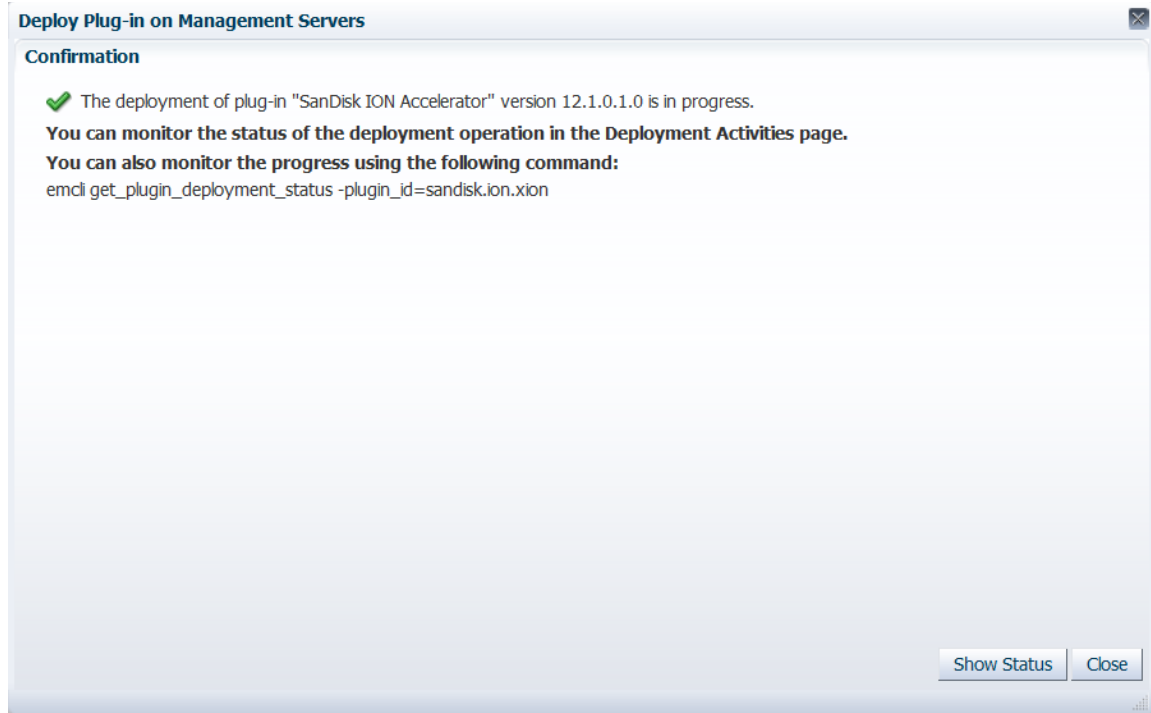


- Click **Deploy** to start the deployment process.

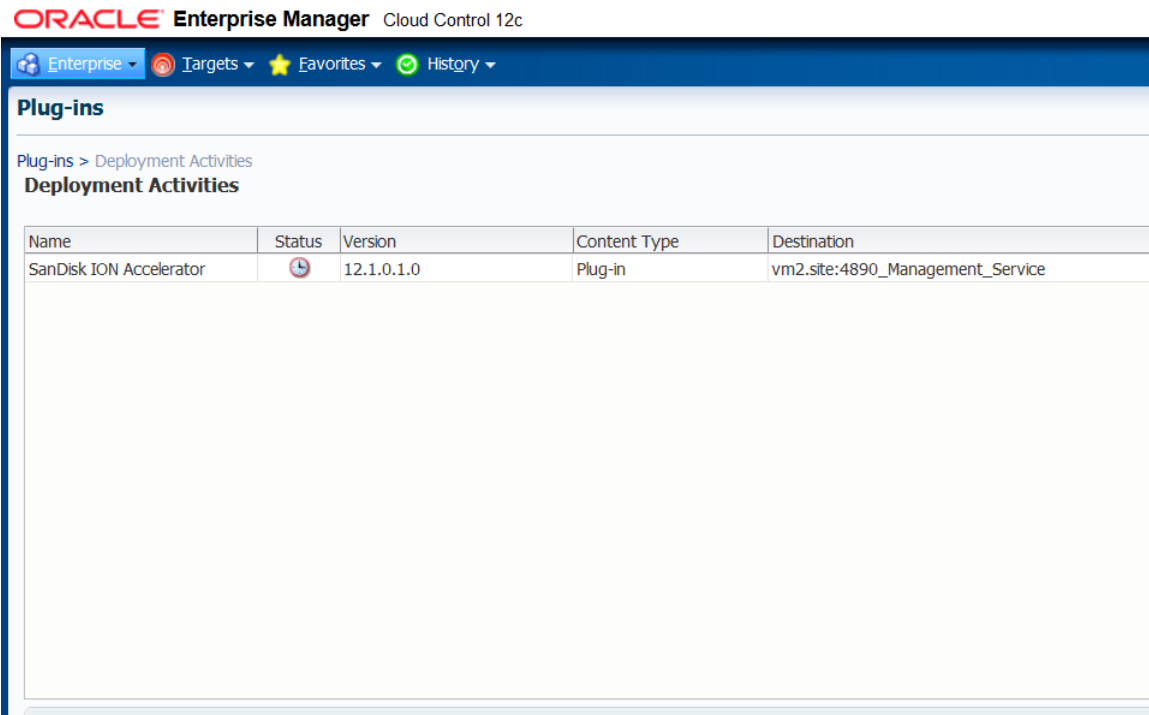


The deployment is complete.

- 9 Click **Show Status** to view the progress of the deployment.



Deployment status is similar to the sample screenshot given here.:



Deploying the plug-in on management agent

- 1 From the main screen, expand the folder Servers, Storage and Network.

- Right-click **SanDisk ION Accelerator**, and then click **Deploy On > Management Agent**.

ORACLE Enterprise Manager Cloud Control 12c

Enterprise Targets Favorites History

Plug-ins

This page lists the plug-ins available, downloaded, and deployed to the Enterprise Manager system. Use this page to deploy or undeploy plug-ins.

Actions View Deploy On Undeploy From Check Updates Deployment Activities

Name	Version			Management Agent with Plug-in	Description
	Latest Available	Latest Downloaded	On Management Server		
Servers, Storage and Network					
EMC CLARION Array	12.1.0.2.0	12.1.0.2.0		0	EMC CLARION Array Monitoring .
EMC Celerra Storage	12.1.0.2.0	12.1.0.2.0		0	EMC Celerra monitoring including reports
EMC Symmetrix Array	12.1.0.2.0	12.1.0.2.0		0	EMC Symmetrix Array Monitoring .
Oracle Storage Management Fr	12.1.0.2.0	12.1.0.2.0		0	Enterprise Manager Storage Management Framework provide underlying storage.
Oracle Virtual Networking	12.1.0.1.0	12.1.0.1.0		0	Enterprise Manager for Oracle Virtual Networking
Oracle Virtualization	12.1.0.5.0	12.1.0.5.0		0	Enables management capabilities for Oracle VM in Enterprise M
SanDisk ION Accelerator	12.1.0.1.0	12.1.0.1.0	12.1.0.1.0	1	Enterprise Manager for SanDisk ION Accelerator consist of mc
Oracle Audit Vault	12.1.0.4.0	12.1.0.4.0		0	Oracle Audit Vault provides monitoring
Oracle Beacon	12.1.0.3.0	12.1.0.3.0	12.1.0.3.0	0	Oracle Beacon provides monitoring required on the Managed Hosts to sur
Oracle Consolidation Planning and	12.1.0.4.0	12.1.0.4.0		0	Enterprise Manager for Oracle Consolidation Planning and Cha targets.
Oracle Engineered System Healthc	12.1.0.3.0	12.1.0.3.0		0	Oracle Engineered System Healthchecks plug-in provides pro
Oracle MOS (My Oracle Support)	12.1.0.5.0	12.1.0.5.0	12.1.0.5.0	0	Oracle MOS plugin provides support for My Oracle Support fe

SanDisk ION Accelerator

Deploy On Undeploy From Information Expand Expand All Below Collapse All Below

- Continue through the basic screens, clicking the ION agents you want to deploy, which are identified by the ION host name.

Deploy Plug-in on Management Agent

Select Management Agents

Name SanDisk ION Accelerator
Version 12.1.0.1.0

Management Agents

Management Agent	Agent Version	Operating System	Deployed Version	Status
oracle-agent-test:3872	12.1.0.1.0	Linux x86-64	None	↑
vm2.site:3872	12.1.0.3.0	Linux x86-64	None	↑

Back Continue Cancel


4 On the Confirmation screen, click **Show Status** to view the deployment status.



In this example, the status shows that the deployment is pending (timer symbol in the Status column).

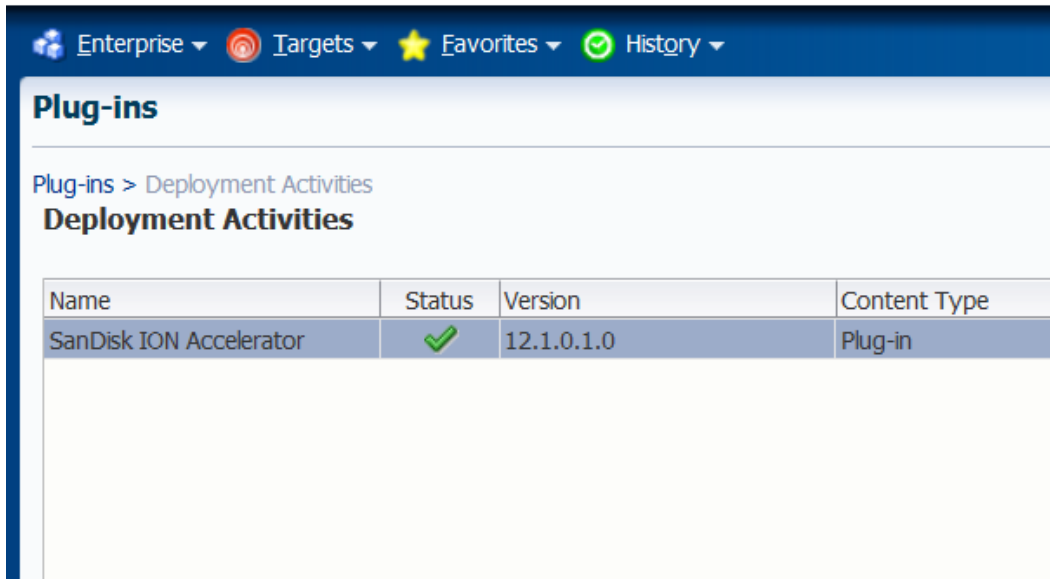
ORACLE Enterprise Manager Cloud Control 12c

The screenshot shows the Oracle Enterprise Manager interface. At the top, there is a navigation bar with "Enterprise", "Targets", "Favorites", and "History" menus. Below this, the page is titled "Plug-ins" and "Deployment Activities". A table displays the deployment activities:

Name	Status	Version	Content Type
SanDisk ION Accelerator		12.1.0.1.0	Plug-in

In the next example, the status shows that the deployment is finished (checkmark in the Status column).

ORACLE Enterprise Manager Cloud Control 12c



Enterprise ▾ Targets ▾ Favorites ▾ History ▾

Plug-ins

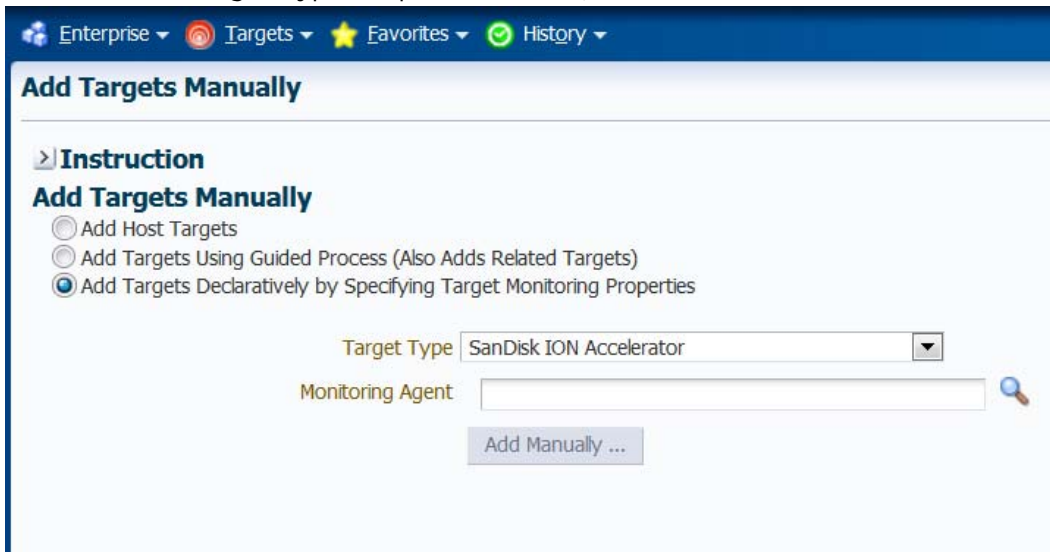
Plug-ins > Deployment Activities

Deployment Activities

Name	Status	Version	Content Type
SanDisk ION Accelerator	✓	12.1.0.1.0	Plug-in

Adding a target

- 1 From the homepage, click **Setup > Add Target > Add Targets Manually**.
- 2 Click **Add Targets Declaratively by Specifying Target Monitoring Properties**.
- 3 From the Target Type drop-down menu, select **SanDisk ION Accelerator**.



Enterprise ▾ Targets ▾ Favorites ▾ History ▾

Add Targets Manually

> Instruction

Add Targets Manually

Add Host Targets

Add Targets Using Guided Process (Also Adds Related Targets)

Add Targets Declaratively by Specifying Target Monitoring Properties

Target Type: SanDisk ION Accelerator ▾

Monitoring Agent: 🔍

Add Manually ...

- 4 To search for an agent (that you deployed on DAAD), click the Search icon to the side of the Monitoring Agent box.
- 5 Click the magnifying glass on the screen which will enable you to click the desired agent (the same agent deployed and identified by the Dell Acceleration Appliance for Databases host name).
- 6 Click **Add Manually**.

ORACLE Enterprise Manager Cloud Control 12c

Enterprise ▾ Targets ▾ Favorites ▾ History ▾

Add Targets Manually

Instruction

Add Targets Manually

Add Host Targets

Add Targets Using Guided Process (Also Adds Related Targets)

Add Targets Declaratively by Specifying Target Monitoring Properties

Target Type SanDisk ION Accelerator ▾

Monitoring Agent oracle-agent-test:3872 🔍

Add Manually ...

- 7 Enter the relevant information, including the Oracle user and password (created when configuring ION for Oracle).

ORACLE Enterprise Manager Cloud Control 12c

Add SanDisk ION Accelerator
Add a target to be monitored by Enterprise Manager by specifying target monitoring properties.

* Target Name
Target Type SanDisk ION Accelerator
Agent <https://oracle-agent-test:3872/emd/main/>

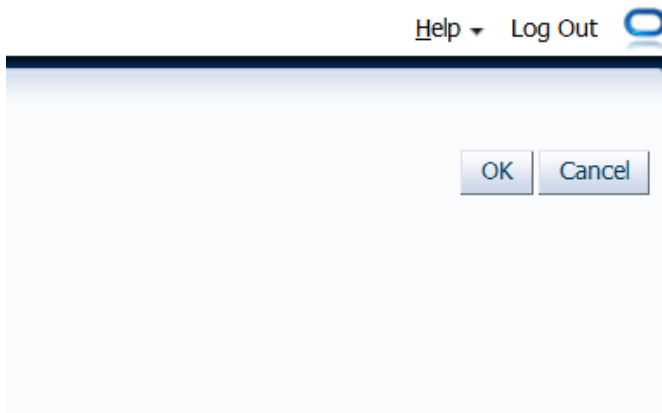
ION Monitoring Credentials

Credential type HostIONCredsType
Username
Password
Confirm Password

Properties

[Global Properties](#)

- 8 Click **OK**.



9 Click **Close**.



Undeploying and removing the plug-in

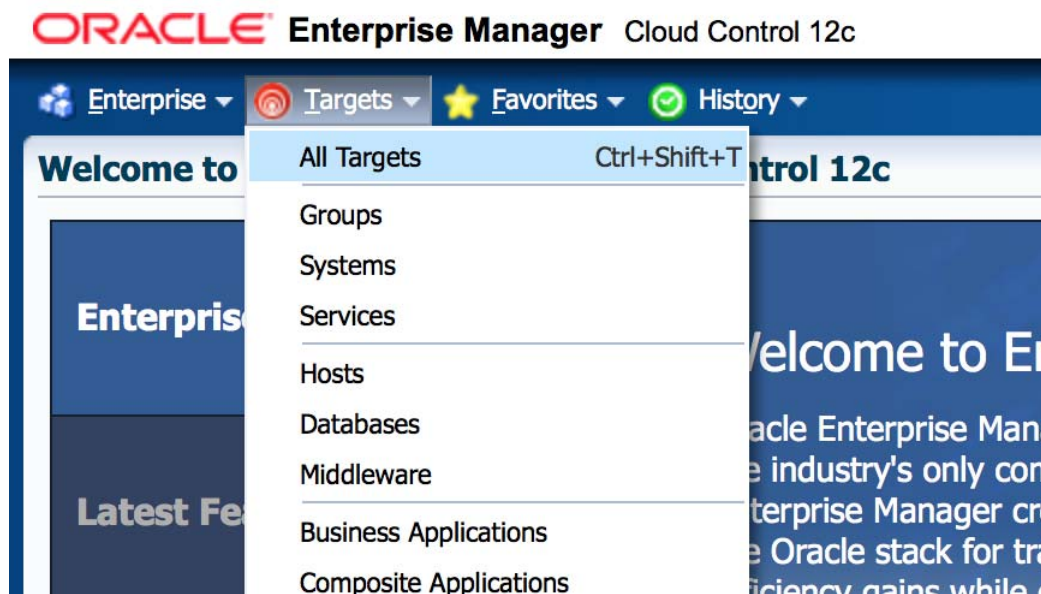
To reverse a deployment of the plug-in:

- 1 Log in to OEM as sysman (administrator) by using a web browser. For example, <https://192.168.2.65:7803/em/>
- 2 Navigate to **Setup > Extensibility > Plug-ins**.
- 3 Expand the storage folder.
- 4 Right-click the ION Plug-in and click **Undeploy From**.
- 5 Click **Management Agent**, and then **Management Server** to undeploy from both locations.
- 6 To delete the plug-in, navigate to **Setup > Extensibility > Self Update**.
- 7 Click **Plug-in** (in the Type dialog box).
- 8 Enter **ION** for a search description.
- 9 Click **Remove** from the Action drop-down menu.

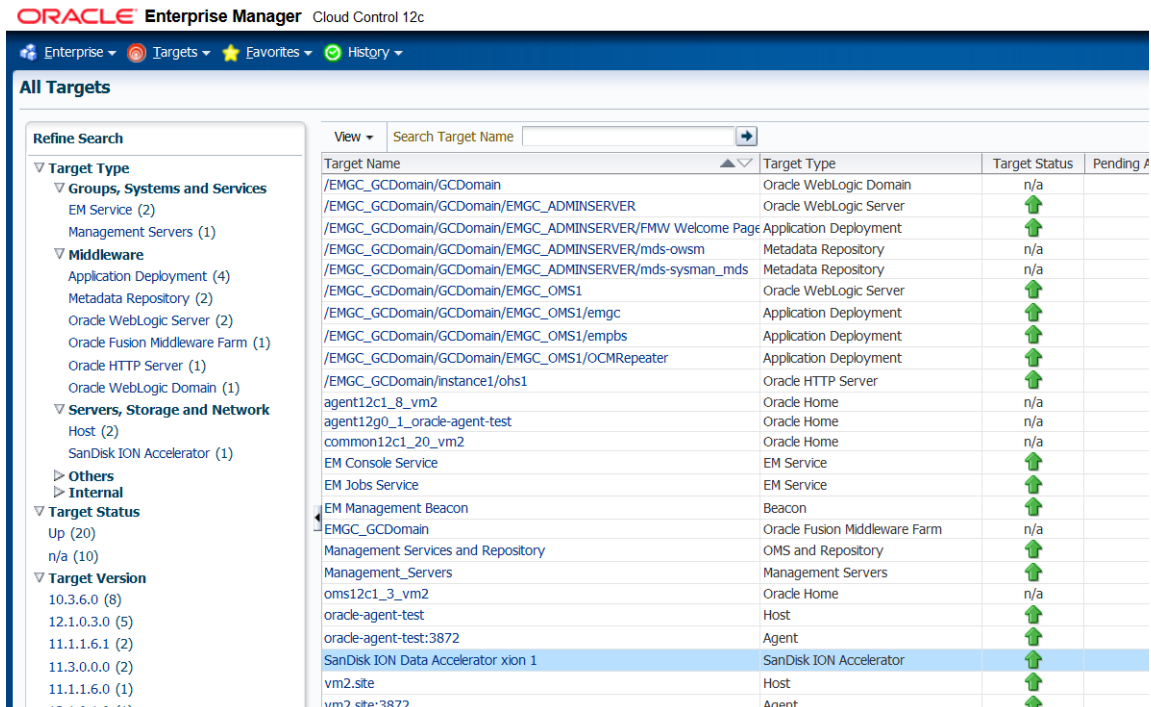
Using the OEM plug-in

Opening the plug-in

- 1 Log in to Oracle Enterprise Manager.
- 2 Click **All Targets** from the Targets menu.



- 3 Select **SanDisk ION Accelerator** from the list of targets to load the plug-in homepage.



Metrics data granularity and graph refresh timing

The Dell Acceleration Appliance for Databases Plug-in displays multiple metrics, with various graphs displaying data gathered from Dell Acceleration Appliance for Databases and stored by the OMS. There is much more information gathered and stored than is displayed in the pre-defined plug-in pages. Therefore, OEM administrators can create customized reports to match the environment and its specific requirements.

When reviewing the plug-in default pages or defining custom reports, it is important to understand the timing of collection of the DAAD data and the default metrics refresh rate.

Data collection period


The default data collection period for the plug-in is five minutes (as suggested by Oracle's documentation). For data measured in a per-second granularity, the plug-in automatically averages the data over the collection period. For example, when an I/O performance figure is retrieved from the collected data, it would reflect the average IOPS over the collection period — by default, five minutes.

This collection period can be changed by the OEM Administrator, and the plug-in will support periods as short as one minute.

Metric update period

The default timing for metrics, graphs, table updates, and refresh timing depends on the specific metrics, as well as any custom report metrics defined by the user.

The timing of metrics for various pages is shown in the following tables (m=minutes, s=seconds).

NOTE: When a manual refresh is required, click the circular arrow icon in the upper-right corner ().

Home Page Metrics

Metrics	Data Collection Granularity	Metric update timing
Availability and status	1m — Default OEM 'Heartbeat'	Instant upon detection
Incidents and Problems	5m for Dell Acceleration Appliance for Databases-related errors; stored, instant for OEM- related errors	Instant upon detection
Array processor use (24hr)	5m — stored	Manual refresh required
IO Performance (24hr)	5m — stored	Manual refresh required
Resource summary (pie chart)	5m — stored	Automatic — circa every 30s
LUNs (table)	15s (not stored)	Automatic — circa every 60s

Performance IOPS Page Metrics

Metrics	Data Collection Granularity	Metric update timing
Target Port Read Performance	Every 5m — stored	Graph updates in 15m intervals, adding 3 x 5m data points to the graph. Requires manual refresh.
Target Port Write Performance	Every 5m — stored	Graph updates in 15m intervals, adding 3 x 5 m data points to the graph. Requires manual refresh.
24hr IO performance	Every 5m — stored	Graph updates in 15m intervals, adding 3 x 5 minute data points to the graph. Requires manual refresh.
Volumes performance	Every 15 s — not stored	Automatic — circa every 15s

Performance Bandwidth Page Metrics

Metrics	Data Collection Granularity	Metric update timing
Target Port Read Performance	Every 5m — stored	Graph updates in 15m intervals, adding 3 x 5m data points to the graph. Requires manual refresh.
Target Port Write Performance	Every 5m — stored	Graph updates in 15m intervals, adding 3 x 5m data points to the graph. Requires manual refresh.
24hr MBs performance	Every 5m — stored	Graph updates in 15m intervals, adding 3 x 5m data points to the graph. Requires manual refresh.
Volumes performance	Every 15s — not stored	Automatic — circa every 15s

Storage Pool Page Metrics

Metrics	Data Collection Granularity	Metric update timing
Pool capacity (bar chart)	Every 5mins — stored	Automatic — circa 30s
Pool Performance (IOPS) Graph	Every 5mins — stored	Graph updates in 15m intervals, adding 3 x 5m data points to the graph. Requires manual refresh.
Pool Performance (Bandwidth) — Graph	Every 5mins — stored	Graph updates in 15m intervals, adding 3 x 5m data points to the graph. Requires manual refresh.
Pool Details — Table	Every 15s — not stored	Automatic — circa 15s
Detail pool & volume performance	Every 15s — not stored	Automatic — circa 15s

Metric data retention period

The data collected by the Dell Acceleration Appliance for Databases Plug-in is stored along with data collected by all plug-ins within an OEM repository, which by default is purged every 31 days. This can be changed if required by the OEM administrator.

Primary pages

Opening the plug-in displays the homepage. On the home page, you can access a range of statistics and details. The plug-in is designed to be equally informative and useable by anyone with little or no OEM experience.

Four key primary pages display the most relevant information in a clear and concise method:

- Home (the default page)
- Performance MB
- Performance IO
- Pool Details

These are described in detail in the following pages and can be easily accessed from the menu:

ORACLE Enterprise Manager Cloud Control 12c

The screenshot displays the Oracle Enterprise Manager Cloud Control 12c interface. At the top, there is a navigation bar with icons for Enterprise, Targets, Favorites, and History. Below this, the main header shows 'SanDisk ION Data Accelerator xion 1' with a refresh icon. A dropdown menu is open, listing various navigation options: Home, Monitoring, Control, Job Activity, Information Publisher Reports, Performance MB, Performance IO, Pool Details, Configuration, Compliance, Target Setup, and Target Information. The background shows a graph titled 'Utilization % (Last 24 hours)' with a y-axis ranging from 2.8 to 4.0. To the right, there is a section for 'Incidents and Problem' with a target set to 'Local target and' and a message field.

Homepage

The Homepage provides an overall summary and snapshot of the Dell Acceleration Appliance for Databases over a period of time (the default is 24 hours). The main sections of the page are identified in the example.

Oracle Enterprise Manager Cloud Control 12c

Enterprise | Targets | Favorites | History

SanDisk ION Data Accelerator xion 1

ION Accelerator Host

Summary

Target Name: SanDisk ION Data Accelerator xion 1

Current Status: Up

Up Since: 17 Apr 2015 10:39 CEST

Hosted By: oracle-agent-test

Incidents and Problems

* Target: Local target and related targets | * Category: All

Message	Target	Severity	Status

ION Accelerator Storage Processor Utilization % (Last 24 hours)

ION Accelerator Performance (Last 24 hours: Read/Write IOPS)

Summary of ION Accelerator Resource

Details

■ Space Free (GB) (68.4%) ■ Space Used (GB) (31.6%)

LUNs

Export	Volume ID	Capacity (GB)	LUN ID	LUN	Allowed Hosts
1	volume-1	100	iqn.2007-02.com.fusionio:sn.cz1-	0	iqn.1991-05.com.microsoft:vm-win1 iqn.1991-
2	volume-2	45	iqn.2007-02.com.fusionio:sn.cz1-	1	iqn.1991-05.com.microsoft:vm-win1 iqn.1991-
3	volume-3	114	iqn.2007-02.com.fusionio:sn.cz1-	2	iqn.1991-05.com.microsoft:vm-win1 iqn.1991-
4	volume-4	22	iqn.2007-02.com.fusionio:sn.cz1-	3	iqn.1991-05.com.microsoft:vm-win1 iqn.1991-
5	volume-5	80	iqn.2007-02.com.fusionio:sn.cz1-	4	iqn.1991-05.com.microsoft:vm-win1 iqn.1991-
6	volume-6	400	iqn.2007-02.com.fusionio:sn.cz1-	5	iqn.1991-05.com.microsoft:vm-win1 iqn.1991-

Summary

The Summary metric identifies the Dell Acceleration Appliance for Databases being assessed, current status, current uptime, and hostname.

Summary

Target Name: ion-yq5f3l3-ion43

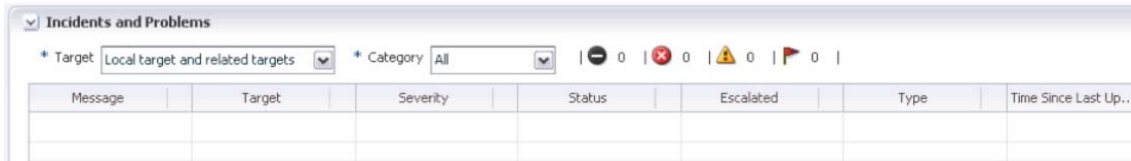
Current Status: Up

Up Since: 12 Mar 2014 11:18 CET

Hosted By: ion-yq5f3l3

Incidents and problems

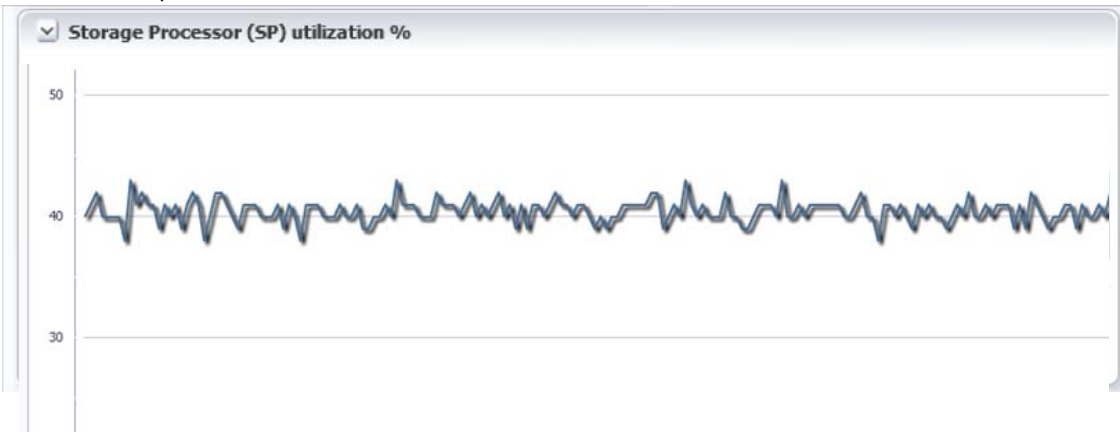
The Incidents and Problems section provides a historical log of Dell Acceleration Appliance for Databases and DAAD Agent errors that OEM considers as critical.



Message	Target	Severity	Status	Escalated	Type	Time Since Last Up...

Storage processor utilization

The Storage Processor Utilization section shows a historic log of Dell Acceleration Appliance for Databases processor utilization. This enables the DBA to determine the overall load on the DAAD and to determine whether or not the processor load has any relation to any periods of low database performance. The time intervals captured are two hours apart.



Performance

The Performance section, also explained in detail later, provides an overall summary of the Dell Acceleration Appliance for Databases performance. The information here is based on IOPS, not bandwidth (MBps), and the time-capture interval is one hour.



Summary of resource

The Summary of Resource section provides a pie chart representation of the total capacity resources (storage pools) as free or used disk space.

Details



LUNs

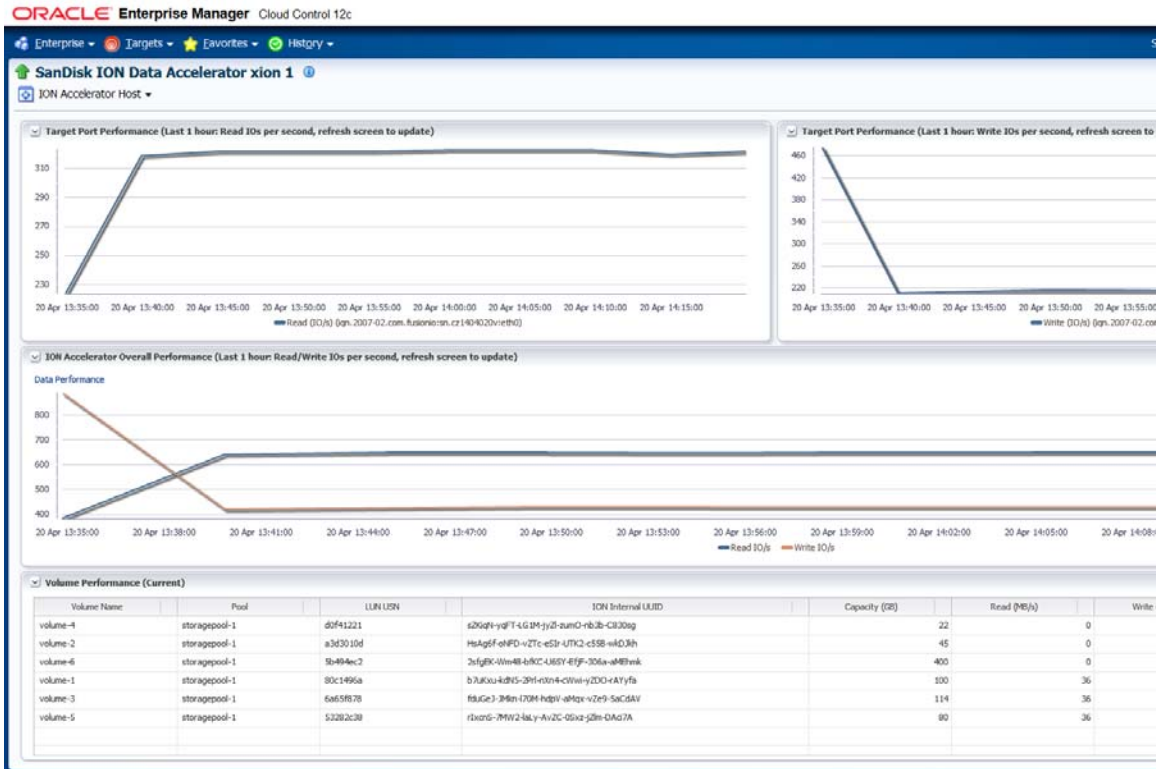
The LUNs section provides an overview of the current LUNs. The following attributes are displayed:

- Export: (Internal usage)
- Volume ID: Name of the volume (within the storage pool) that is the LUN destination
- Capacity (GB): Size of the LUN in GB
- LUN ID: Target ID, depending on the protocol used. For example, Fibre Channel uses the WWN of the LUN.
- LUN: Logical Unit Number
- Allowed Hosts: If the LUN is grouped, this attribute show the ID (WWN, IQN, or GUID) for each host that can see the LUN.
- Connected Hosts: ID (WWN, IQN, or GUID) of each host actively connected to the LUN

Performance pages

There are two performance pages: one shows the IO performance (IOPS) and the second shows the bandwidth performance (MBps). Both pages have a similar layout.

The example page shows the layout of the performance screens, with the top two metrics showing the read and write performance of each target port within the ION Host.



Target port performance

A sample Target Port Performance chart is shown, with a time interval set to four minutes.



When reviewing storage performance, it is important to identify the load on each available port. Given that each port has hardware or topology performance limits, it is a normal practice to distribute the load over multiple ports (paths), providing the best performance and availability.

Monitoring the load on individual ports can help you improve performance. Customer Support can also assist in this process.

DAAD overall performance

The Dell Acceleration Appliance for Databases Overall Performance metrics show a historic graph of the overall read and write performance, which is useful for ascertaining trends and performance profiles.

The figures are for MBps or IOps, based on the performance page being reviewed.



Volume performance

The volume performance metrics provide more accurate individual volume performance data, which are highly useful when reviewing storage performance. The table fields are Volume Name, Pool, LUN USN, Dell Acceleration Appliance for Databases Internal UUID, Capacity (GB), Read MB/s, Write MB/s, Read IOPS, and Write IOPS.

NOTE: These figures are gathered every 15 seconds, but they are not stored for historical review. Only the figures gathered at the defined collection time (default of 5 minutes) are stored.

Sorting volume performance order

By default, the Volume Performance tables are ordered by volume name, but this can be changed by clicking the appropriate column. For example, it may be useful to identify the volumes in order of performance, as in the second example.

Sorted by volume name:

Volume Performance (Current)				
Volume Name	Pool	LUN USN	ION Internal UUID	Capa
volume-1	storagepool-1	12d61dfd	9Z6exn-hQIH-d9mI-v5Vk-QXD2-NqTP-zSGmNW	
volume-2	storagepool-1	f6460da2	3Noxvq-WLKe-AB8b-BMEZ-k1zO-mkrv-EJebXS	
volume-3	storagepool-1	e024655b	7xF041-zLHg-9Adz-uMIN-UtCa-bF80-8YuhAq	
volume-4	storagepool-1	5a116ba1	kR.3xjk-qp5n-HeDU-bErf-YVWN-HDI2-z4xW5U	

Sorted by volume performance (read MBps, descending order):

Volume Performance (Current)					
Volume Name	Pool	LUN USN	ION Internal UUID	Capacity (GB)	Read (MB/s)
volume-2	storagepool-1	f6460da2	3Noxvq-WLKe-AB8b-BMEZ-k1zO-mkrv-EJebXS	50	111
volume-1	storagepool-1	12d61dfd	9Z6exn-hQIH-d9mI-v5Vk-QXD2-NqTP-zSGmNW	200	15
volume-3	storagepool-1	e024655b	7xF041-zLHg-9Adz-uMIN-UtCa-bF80-8YuhAq	460	0
volume-4	storagepool-1	5a116ba1	kR.3xjk-qp5n-HeDU-bErf-YVWN-HDI2-z4xW5U	700	0

Storage pool page

The storage pool page, displays the used and available capacity for the storage pool(s) and individual volumes. It also shows IOPS and bandwidth performance for storage pools.

ORACLE Enterprise Manager Cloud Control 12c

Enterprise Targets Favorites History

SanDisk ION Data Accelerator xion 1

ION Accelerator Host

Pool(s)

Pool	Free Space (GB)	Pool Capacity (GB)
storagepool-1	1649	2410

Pool(s) Performance (Last 1 hour: R/W IOs)

Time	Read IO/s	Write IO/s
20 Apr 13:35:00	3600	4000
20 Apr 13:40:00	5000	3400
20 Apr 13:45:00	4900	3400

Pool(s) Details (Performance figures are current)

ID	Profile	Free Space (...)	Pool Capacit...	Devices	Read IO/s	Write IO/s	Read MB	Write MB
storagepool-1	Maximum Performa...	1649	2410	fib floa	6871	762	109	12

Pool(s) Performance (Last 1 hour: MBs per s)

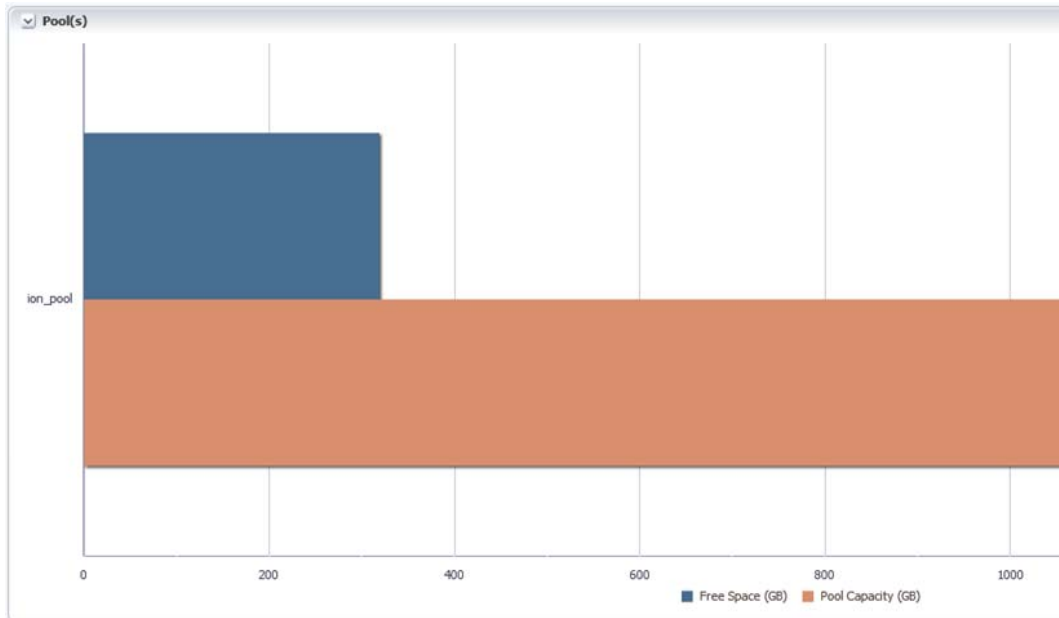
Time	Read MB/s	Write MB/s
20 Apr 13:35:00	52	58
20 Apr 13:40:00	80	52
20 Apr 13:45:00	78	52

Pool(s) detailed usage per 'volume' (Performance figures are current)

Pool	Volume Name	LUN USN	ION Internal UUID	Capacity (GB)	R
storagepool-1	volume-4	00f41221	s2kqN-yqFT-LGIM-jyZl-zumO-nib3b-C830sg	22	
storagepool-1	volume-2	a3d3010d	HsAg6f-nNFD-vZTc-e5tI-UTK2-c55B-wKD3kh	45	
storagepool-1	volume-6	5b494ec2	2sfigEK-Wim48-bRKC-U6SY-EfjF-306a-aMEhmk	400	
storagepool-1	volume-1	80c1496a	b7uKxu-ktN5-2PrI-nXn4-cWwi-yZDO-fAYyfa	100	
storagepool-1	volume-3	6a65f878	fduGeJ-3Mkn-170M-hdpV-aMqx-vZe9-SaCdAV	114	
storagepool-1	volume-5	53282c38	r1xcnS-7MW2-lalY-AvZC-0Sxz-jZfm-DAc7A	80	

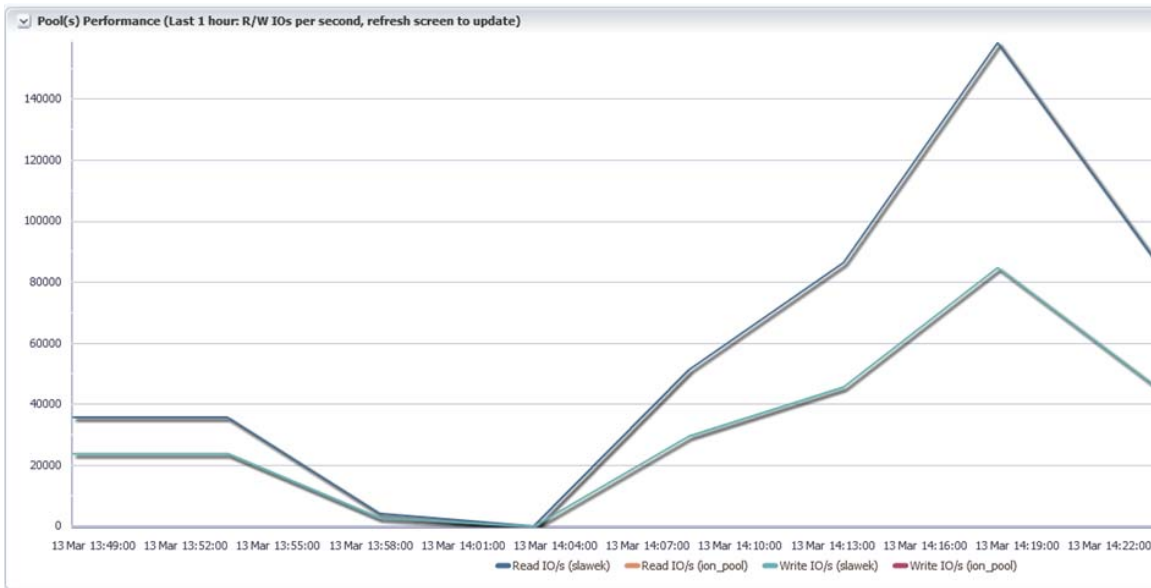
Pool capacity

The Pool capacity graph shows the free disk space (blue) and used disk space (tan) for each Dell Acceleration Appliance for Databases storage pool, in GB.



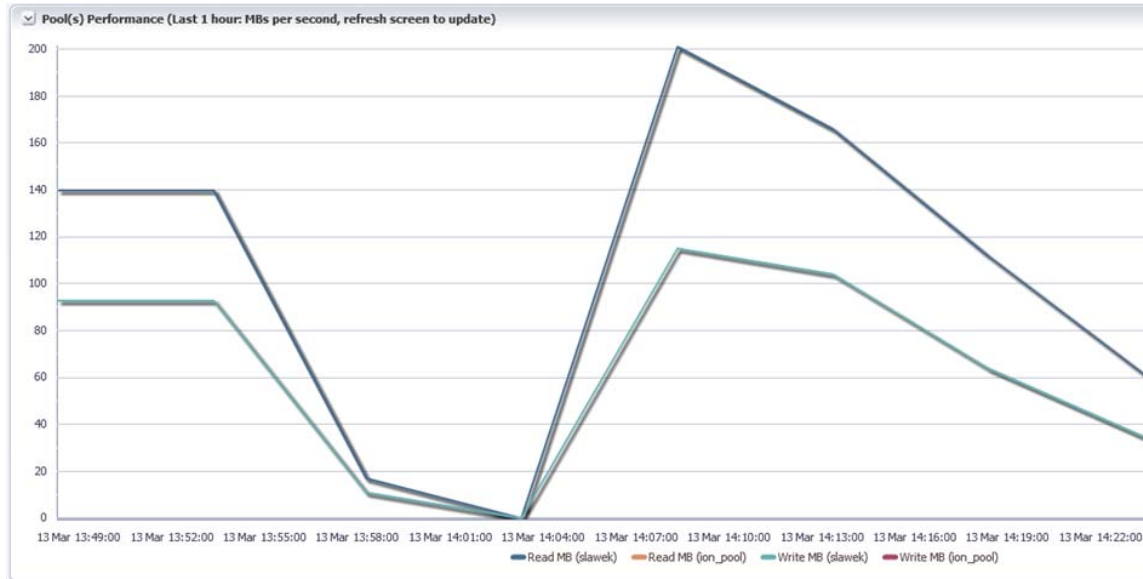
Pool performance, IOPS

The performance graph near the top of the page shows read and write IOPS for each storage pool. The chart uses three-minute time intervals for plotting data.



Pool performance, bandwidth

The performance graph in the middle of the page shows read and write bandwidth (MBps) for each storage pool. The chart uses three-minute time intervals for plotting data.



Pool details

The Pool Details table shows the following fields: Pool ID, Storage Profile, Free Space (GB), Pool Capacity (GB), Devices (for example, `fioa`, `fioB`), Read IOPS, Write IOPS, Read Bandwidth (MBps), and Write Bandwidth (MBps)

Pool detailed usage per volume

The Pool Detailed Usage per Volume table shows the following fields: Pool ID, Volume Name, LUN USN, and Dell Acceleration Appliance for Databases Internal UUID.

Drill-down pages

In addition to the four primary pages, the plug-in has a number of additional pages that display the data and statistics used to create all the metrics shown earlier. These screens provide much more detail and enable the user to drill down to find very specific information.

Using such drill-down pages is common practice with Oracle DBAs. While it is beyond the scope of this guide to cover the many possible screens and variations, the following example helps to demonstrate the plug-in's flexibility and granularity.

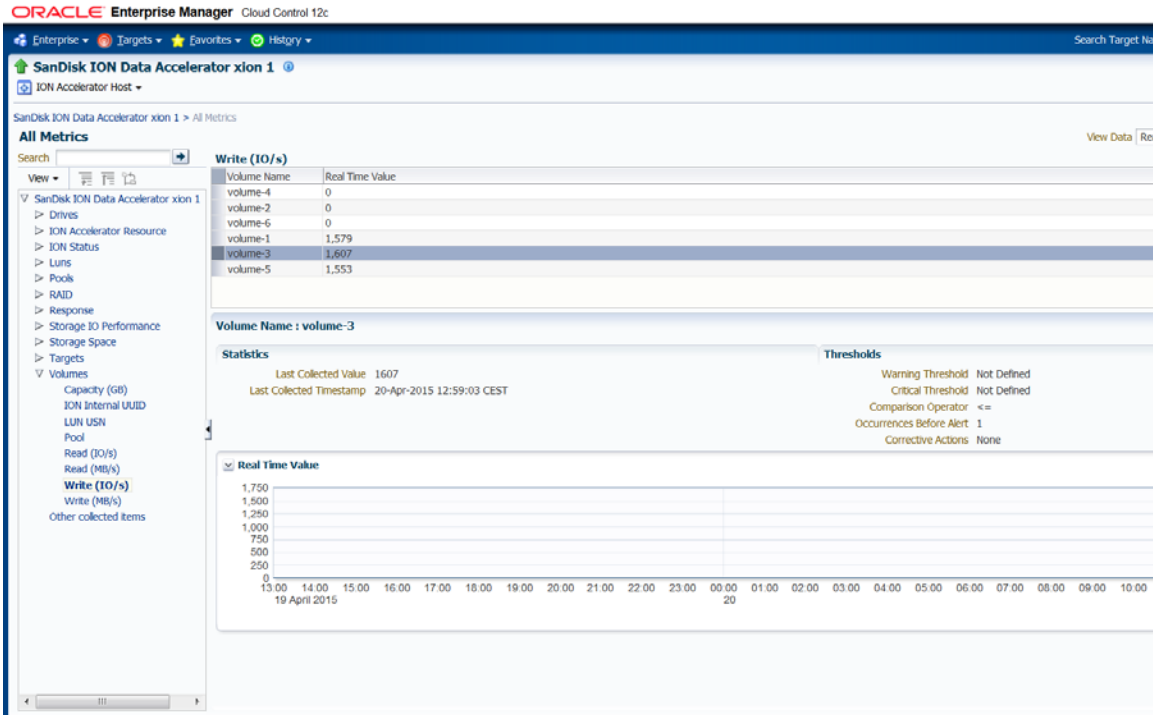
To access the drill-down options from the Homepage, click **Monitoring > All Metrics**.

The screenshot displays the Oracle Enterprise Manager Cloud Control 12c interface for a SanDisk ION Data Accelerator xion 1. The 'Monitoring' menu is expanded, showing 'All Metrics' as the selected option. The main dashboard includes several panels:

- Incidents and Problems:** A table with columns for Message, Target, Severity, Status, Escalated, and T. It shows a target for 'Local target and related targets' with a category of 'All'.
- Utilization % (Last 24 hours):** A line graph showing utilization percentage over time, with a peak around 20 Apr 10:00:00.
- ION Accelerator Performance (Last 24 hours: Read/Write IOs per second):** A line graph showing Read IOs (blue) and Write IOs (orange) over time, with Read IOs consistently higher than Write IOs.
- Summary of ION Accelerator Resource:** A pie chart showing Space Free (28) at 58.4% and Space Used (28) at 31.6%.
- LUNs:** A table listing LUNs with columns for Export, Volume ID, Capacity (GB), LUN ID, LUN, and Allowed Hosts.

Export	Volume ID	Capacity (GB)	LUN ID	LUN	Allowed Hosts
1	volume-1	100	iqn.2007-02.com.fusion-io:cn-c21-	0	iqn.1991-05.com.microsoft:vm-win1 iqn.1991-05.com.microsoft:vm-win1#192. iqn.1991-05.com.i
2	volume-2	45	iqn.2007-02.com.fusion-io:cn-c21-	1	iqn.1991-05.com.microsoft:vm-win1 iqn.1991-05.com.microsoft:vm-win1#192. iqn.1991-05.com.i
3	volume-3	134	iqn.2007-02.com.fusion-io:cn-c21-	2	iqn.1991-05.com.microsoft:vm-win1 iqn.1991-05.com.microsoft:vm-win1#192. iqn.1991-05.com.i
4	volume-4	22	iqn.2007-02.com.fusion-io:cn-c21-	3	iqn.1991-05.com.microsoft:vm-win1 iqn.1991-05.com.microsoft:vm-win1#192. iqn.1991-05.com.i
5	volume-5	80	iqn.2007-02.com.fusion-io:cn-c21-	4	iqn.1991-05.com.microsoft:vm-win1 iqn.1991-05.com.microsoft:vm-win1#192. iqn.1991-05.com.i
6	volume-6	400	iqn.2007-02.com.fusion-io:cn-c21-	5	iqn.1991-05.com.microsoft:vm-win1 iqn.1991-05.com.microsoft:vm-win1#192. iqn.1991-05.com.i

The following screenshot compares the read MBps performance of two selected volumes.



About Ganglia

Beginning with firmware version 2.5.1, the Dell Acceleration Appliance for Databases is compatible with Ganglia, an Open Source monitoring application that enables the user to observe the performance and status of your DAAD through the Ganglia www-based administration console. (For more information about Ganglia refer to <http://www.ganglia.info/>.)

The Dell Acceleration Appliance for Databases is pre-configured with a Ganglia monitoring daemon (gmond) which, after it is enabled by the user, will automatically provide the Ganglia server with the information performance and usage data.

Prerequisites

- Dell Acceleration Appliance for Databases firmware version 2.5.1 or higher
- A Ganglia server (receiver) running in Unicast mode (Multicast mode is not supported)
- Network connectivity between the Dell Acceleration Appliance for Databases and the Ganglia server
- The user have familiarity with Ganglia and its administration

Additional reference materials are available for Ganglia at <https://github.com/ganglia/>.

Configuring Ganglia

Ganglia can be configured on the console of the Dell Acceleration Appliance for Databases using the `manage:ganglia` CLI command.

To configure Ganglia:

- 1 Log in to the Dell Acceleration Appliance for Databases console with the admin user account.

For example, if the IP address of the appliance were 10.1.100.10, enter

```
ssh admin@10.1.100.10
```

- 2 At the CLI, enter

```
manage:ganglia --host <GangliaServerAddress> --port <portNum> enable  
where
```

GangliaServerAddress—is the hostname or IP address of the Ganglia agent

port—is the port that the Ganglia agent should use for server communication

For example, if your Ganglia server had an address of 10.1.100.27 and was configured to communicate on port 8660, enter

```
manage:ganglia --host 10.1.100.27 --port 8660 enable
```

The Ganglia monitoring daemon is now enabled on the Dell Acceleration Appliance for Databases and is communicating with the Ganglia agent.

About the `manage:ganglia` command

The capabilities and options of the `manage:ganglia` command are described in the *Dell Acceleration Appliance for Databases CLI Guide*. For convenience, they are reproduced here also.

manage:ganglia

Manage the Ganglia monitoring daemon on the Dell Acceleration Appliance for Databases.

Syntax

```
manage:ganglia [options] <verb>
```

Options

<code>--host</code>	Ganglia Server IP Address (required for enable)
<code>--port</code>	Ganglia Port Number (required for enable)

Common Options

- `--help-all` to see information on `--url`
- `--display`
- `--display-table`
- `--display-list`
- `--display-xml`
- `--display-json`
- `--display-wide`
- `--display-brief`
- `--display-csv`
- `--display-flavor`
- `--wiki`
- `--window`
- `--output-file`
- `--output-scp`
- `--output-ssh`
- `--output-share`
- `--output-usb`

Arguments

<code>disable</code>	Disables the Ganglia integration
<code>enable</code>	Enables the Ganglia integration
<code>start</code>	Starts the Ganglia agent
<code>status</code>	Shows the status of the Ganglia agent
<code>stop</code>	Stops the Ganglia agent

Examples

To enable the Ganglia integration with a server located at 192.168.1.42 which is using port 8660:

```
manage:ganglia --host 192.168.1.42 --port 8660 enable
```

To view the status of the Ganglia agent:

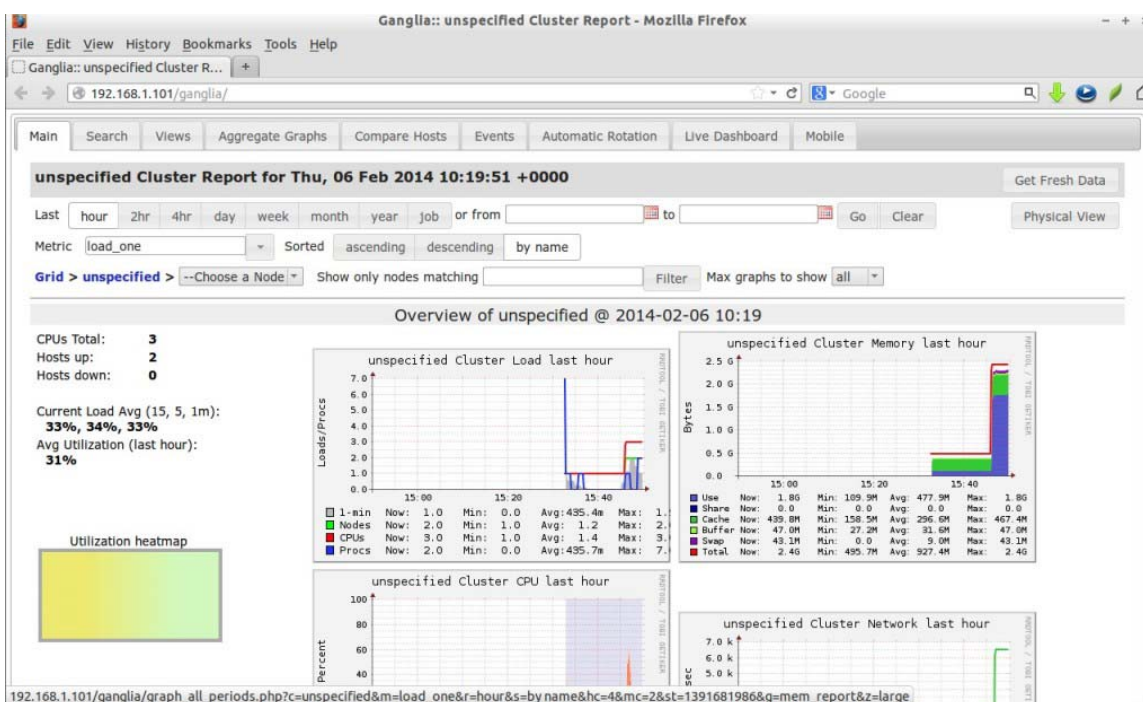
```
manage:ganglia status
```

agent:

```
manage:ganglia status
```


Using Ganglia

Point your browser to your Ganglia server (for example, <http://<ip-address>/ganglia>) and the default client node graphs are displayed.



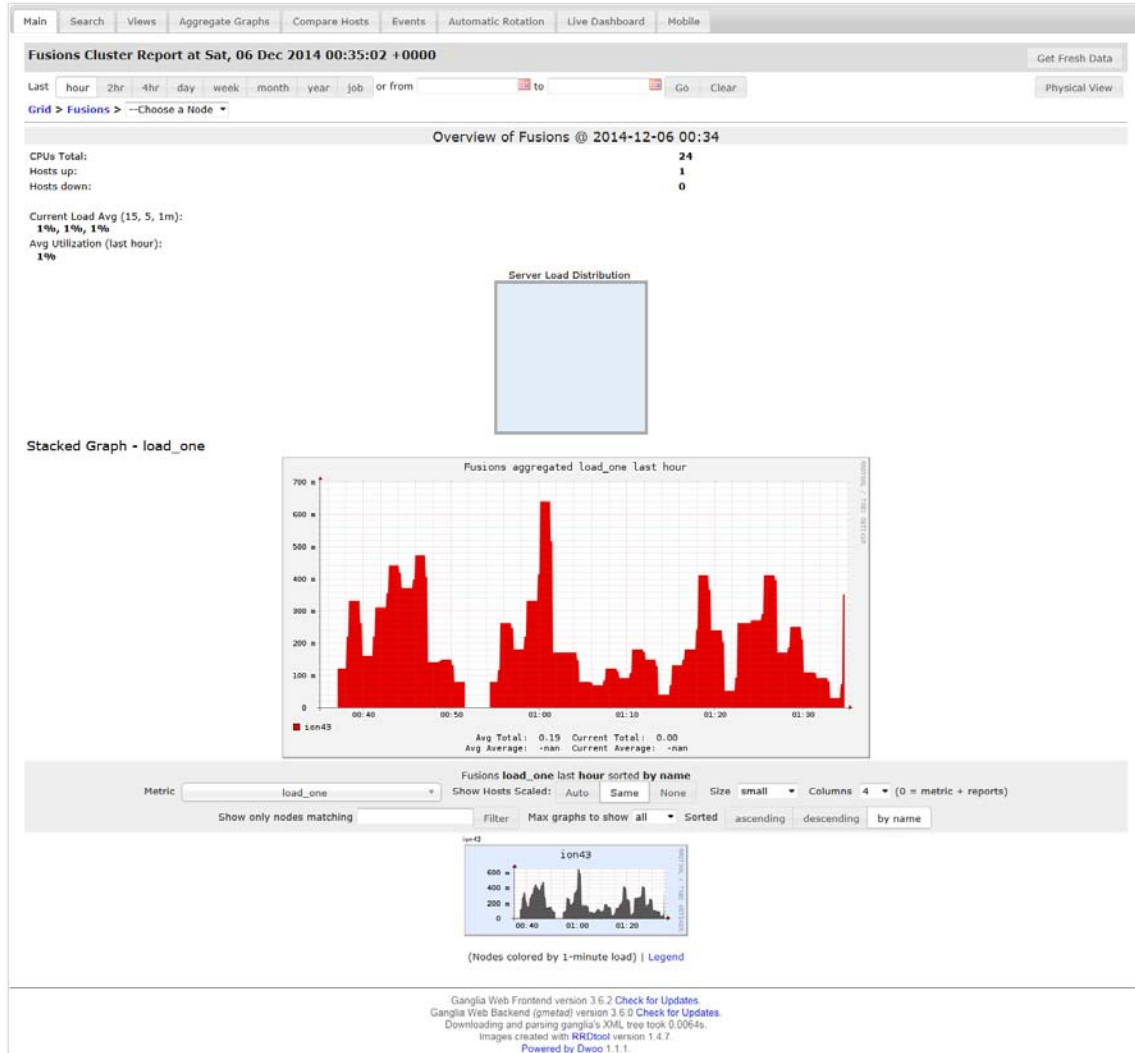
To view a particular Dell Acceleration Appliance for Databases graph, click the particular node you want from the **Choose a Node** drop-down menu. You can now use standard Ganglia features to view and create a range of views to suit your requirements.

A complete list of the data provided by the Dell Acceleration Appliance for Databases is provided in "[DAAD metrics information](#)" on page 58.

For more information about Ganglia, refer to reference materials at <https://github.com/ganglia/>.

Example screens

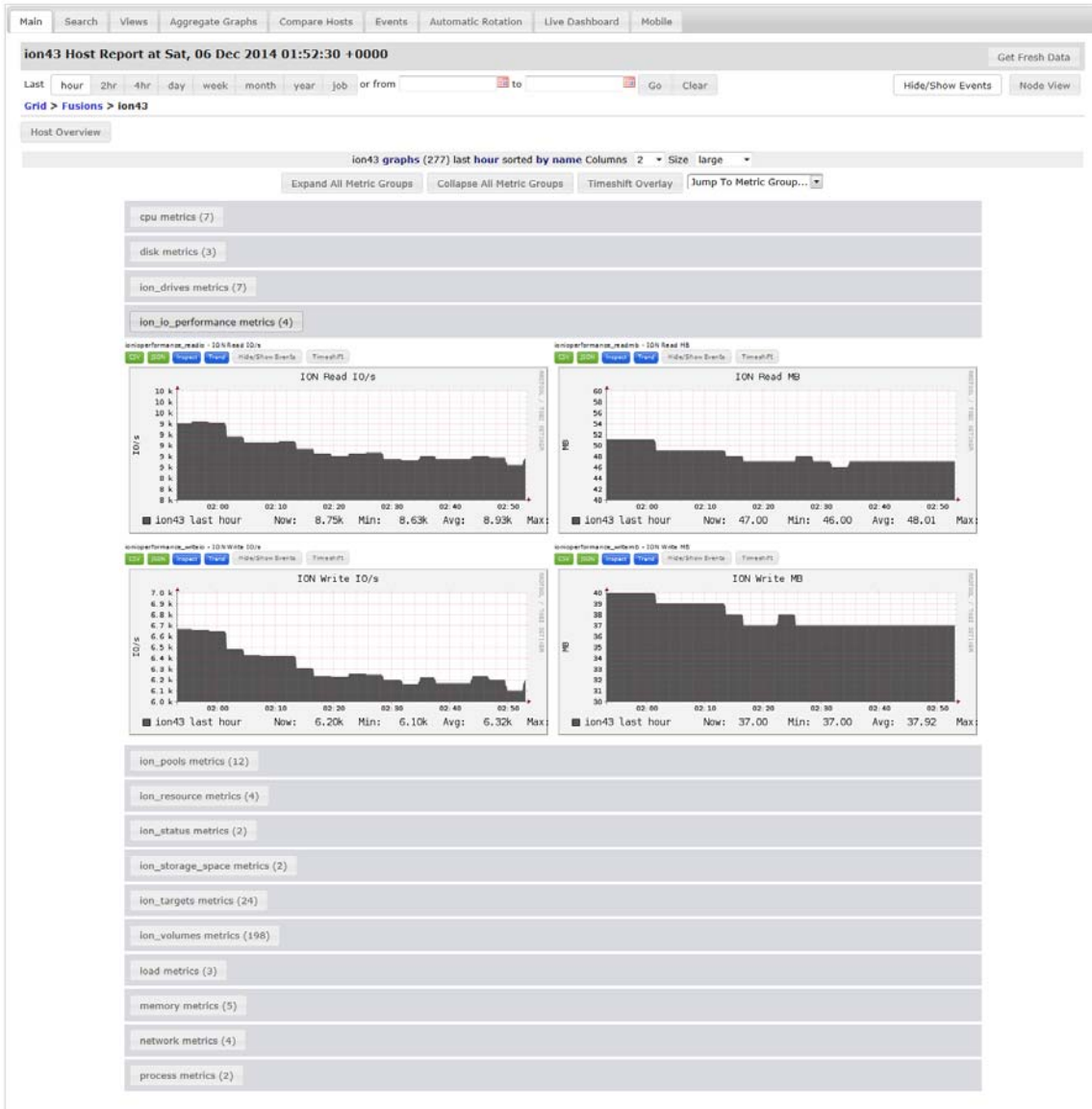
Main page



Drive reports



IOPS performance report



Storage pool report



DAAD metrics information

Table 7-1 provides a complete list of the data and information provided by the Dell Acceleration Appliance for Databases. All the information is available for user reports.

Table 7-1. DAAD data and information

Collection Group	Category	Metric Type	Metric	Metric Name	Metric Unit	Value Type
status	ion	errors	ion_errors	ION current errors	nr	snapshot
status	ion	warnings	ion_warnings	ION Current warnings	nr	snapshot
resource	ion	spidle	ion_spidle	ION Accelerator SP idle - %	%	snapshot
resource	ion	spiowait	ion_spiowait	ION Accelerator SP iowait (%)	%	snapshot
resource	ion	spuse	ion_spuse	ION Accelerator SP use (%)	%	snapshot
resource	ion	memory usage	ion_memoryusage	Memory usage (%)	%	snapshot
storage_space	ionss	space-used	ionss_space-used	ION Space Used	GB	snapshot
storage_space	ionss	space-free	ionss_space-free	ION Space Free	GB	snapshot
drives_perf	iondrives	readio	iondrives_readio_[drive_uuid]	Read IO/s	IO/s	average
drives_perf	iondrives	writeio	iondrives_writeio_[drive_uuid]	Write IO/s	IO/s	average
drives_perf	iondrives	readmb	iondrives_readmb_[drive_uuid]	Read MB	MB/s	average
drives_perf	iondrives	writemb	iondrives_writemb_[drive_uuid]	Write MB	MB/s	average
drives	iondrives	errors	iondrives_errors_[drive_uuid]	Drives errors	nr	snapshot
drives	iondrives	warnings	iondrives_warnings_[drive_uuid]	Drive warnings	nr	snapshot
drives	iondrives	temperature	iondrives_temperature_[drive_uuid]	Drive temperature	degrees (C)	snapshot
pools_perf	ionpools	readio	ionpools_readio_[pool_id]	Read IO/s	IO/s	average
pools_perf	ionpools	writeio	ionpools_writeio_[pool_id]	Write IO/s	IO/s	average
pools_perf	ionpools	readmb	ionpools_readmb_[pool_id]	Read MB	MB/s	average
pools_perf	ionpools	writemb	ionpools_writemb_[pool_id]	Write MB	MB/s	average
pools	ionpools	errors	ionpools_errors_[pool_id]	Pools errors	nr	snapshot
pools	ionpools	warnings	ionpools_warnings_[pool_id]	Pools warnings	nr	snapshot
io_perf	ionioperformance	readio	ionioperformance_readio	Read IO/s	IO/s	average
io_perf	ionioperformance	writeio	ionioperformance_writeio	Write IO/s	IO/s	average
io_perf	ionioperformance	readmb	ionioperformance_readmb	Read MB	MB	average
io_perf	ionioperformance	writemb	ionioperformance_writemb	Write MB	MB	average
volumes_perf	ionvolumes	readio	ionvolumes_readio_[volume_id]	Read IO/s	IO/s	average

Table 7-1. DAAD data and information (continued)

Collection Group	Category	Metric Type	Metric	Metric Name	Metric Unit	Value Type
volumes_perf	ionvolumes	writeio	ionvolumes_writeio_[volume_id]	Write IO/s	IO/s	average
volumes_perf	ionvolumes	readmb	ionvolumes_readmb_[volume_id]	Read MB	MB	average
volumes_perf	ionvolumes	writemb	ionvolumes_writemb_[volume_id]	Write MB	MB	average
volumes	ionvolumes	errors	ionvolumes_errors_[volume_id]	Volume errors	nr	snapshot
volumes	ionvolumes	warnings	ionvolumes_warnings_[volume_id]	Volume warnings	nr	snapshot
targets_perf	iontargets	readio	iontargets_readio_[target_uuid]	Read IO/s	IO/s	average
targets_perf	iontargets	writeio	iontargets_writeio_[target_uuid]	Write IO/s	IO/s	average
targets_perf	iontargets	readmb	iontargets_readmb_[target_uuid]	Read MB	MB/s	average
targets_perf	iontargets	writemb	iontargets_writemb_[target_uuid]	Write MB	MB/s	average
targets	iontargets	errors	iontargets_errors_[target_uuid]	Target errors	nr	snapshot
targets	iontargets	warnings	iontargets_warnings_[target_uuid]	Target warnings	nr	snapshot

Contacting technical support

Dell Acceleration Appliance for Databases drivers, utilities, and related documentation are available at:

dell.com/support/home

Dell provides several online and telephone-based support and service options. Availability varies by country and product, and some services may not be available in your area. To get help with your Fusion ioMemory devices, contact your Dell Technical Service representative or access the Dell Support website.

Choose the method of contacting Dell that is convenient for you.

NOTE: The safety information that shipped with your system provides important safety and regulatory information. Warranty information may be included within this document or as a separate document.

