

The logo features a stylized blue starburst or geometric shape on the left, composed of several overlapping, semi-transparent blue polygons. To the right of this graphic, the text 'iON' is written in a bold, white, sans-serif font. A vertical white line separates 'iON' from the word 'ACCELERATOR™', which is also in a white, sans-serif font. The entire logo is set against a blue background with a pattern of radiating lines and overlapping geometric shapes.

iON | ACCELERATOR™

ION Accelerator™ Appliance 2.4.1
Graphical User Interface (GUI) Guide

7.25.2014



Copyright Notice

The information contained in this document is subject to change without notice.

Fusion-io MAKES NO WARRANTY OF ANY KIND WITH REGARD TO THIS MATERIAL, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Except to correct same after receipt of reasonable notice, Fusion-io shall not be liable for errors contained herein or for incidental and/or consequential damages in connection with the furnishing, performance, or use of this material.

The information contained in this document is protected by copyright.

© 2014, Fusion-io, Inc. All rights reserved.

Fusion-io, the Fusion-io logo, ioMemory, VSL, Virtual Storage Layer and ioDrive are registered trademarks of Fusion-io in the United States and other countries.

The names of other organizations and products referenced herein are the trademarks or service marks (as applicable) of their respective owners. Unless otherwise stated herein, no association with any other organization or product referenced herein is intended or should be inferred.

Fusion-io: 2855 E. Cottonwood Parkway, Suite 100 Salt Lake City, UT 84121 USA

(801) 424-5500

Document No. D0006224-001_2



CONTENTS

Basic Tasks and the Overview Tab	1
BASIC TASK FLOW	1
OVERVIEW SCREEN	3
TABS BAR.....	3
Help.....	4
Changing the Admin Password.....	4
Logout.....	5
Legal Information.....	5
OVERVIEW SCREEN DETAILS	6
Summary Area	6
Slot Area.....	6
Performance Area.....	7
Selecting a Performance View.....	8
UPDATING SOFTWARE	10
Reverting to a Previous Software Version	11
HANDLING CONNECTION LOSS.....	12
Setting up Storage	13
ABOUT STORAGE POOLS FOR ION ACCELERATOR	13
Storage Profile Types.....	13
Naming Conventions for Storage Pools.....	14
Naming Requirements.....	14
HA Considerations.....	14
CREATING A STORAGE POOL.....	15
STORAGE POOL INFORMATION.....	17
COLUMNS (STORAGE POOLS)	18
BASIC SEARCH	18
ENHANCED SEARCH	19
NAVIGATION AND REFRESH.....	19



Configuring Volumes	20
VOLUME INFORMATION.....	20
ADDING A VOLUME.....	21
EDITING OR DELETING A VOLUME	23
EXPANDING CAPACITY	23
COLUMNS AND SEARCH (VOLUMES).....	24
Managing Initiators	25
CREATING INITIATOR GROUPS	26
ASSIGNING AN INITIATOR GROUP TO A VOLUME	27
ADDING INDIVIDUAL INITIATORS.....	29
EDITING THE INITIATOR NAME	29
DELETING AN INITIATOR.....	29
COLUMNS AND SEARCH (INITIATORS)	30
Viewing Targets	31
CREATING AN ALIAS FOR A TARGET PORT.....	32
COLUMNS AND SEARCH (TARGETS)	32
Managing ioMemory.....	33
IOMEMORY CONFIGURATION.....	34
Using the Info Tab	35
COLUMNS AND SEARCH (IOMEMORY)	36
SAVED SEARCHES	37
Getting Host Information	38
HOST CONFIGURATION DETAILS	39
Shutting Down a Host.....	39
Collecting System Logs	40
COLUMNS AND SEARCH (HOSTS)	41
Managing Clusters In HA Configurations	43
COLUMNS AND SEARCH (HA).....	44
Monitoring ION Accelerator Performance.....	45
PERFORMANCE GRAPHS (OVERVIEW TAB).....	45
Interpreting Performance Figures	47
LIVE VIEW.....	47



Viewing Performance for Multiple Devices	49
REPORTS	50
Operations Report.....	50
Changing Report Parameters	51
Data and Endurance Report	52
Temperature Report.....	52
Handling ION Accelerator Alerts.....	53
COLUMNS AND SEARCH (ALERTS)	55
ARCHIVING ALERTS.....	56
ALERTS BY CATEGORY.....	56
Configuring ION Accelerator Settings.....	57
APPLICATION	57
Network	58
Remote Access.....	59
Agents.....	60
Database	60
Saved Searches	60
USERS	61
Local Accounts.....	61
Identity Providers (LDAP)	64
ALERTS.....	64
Rules.....	64
SMTP Server.....	67
SNMP Settings	67
Subscribers	69
Customer Support.....	71
Glossary of Terms.....	72
Appendix A: WEEE Advisement Disposal and Acknowledgment	73
Appendix B: Changing Node Names and IP Addresses	74
Changing a Node Name in a Cluster	74
Changing the Management IP Address.....	74
Changing the ION Accelerator Cluster Name or Cluster IP Address	74



Changing the Gateway IP Address	75
Changing the IP Addresses for Cluster Interconnect Ports	75
Changing the iSCSI Port IP Address.....	75
Appendix C: System Alert Rules and Alert Parameters	76
ERRORS	76
WARNINGS	81
ALERT PARAMETER ATTRIBUTES.....	86
Appendix D: SNMP MIB Information	87
Appendix E: About the ION Accelerator Appliance Guides	96



Basic Tasks and the Overview Tab



It is a best practice to save and back up configurations of your ION Accelerator system on a regular basis. As you set up storage pools, create volumes, manage initiator groups, etc., be sure to back up your current configuration. For information on backing up and restoring configurations, see the Configuration commands in the *ION Accelerator Appliance CLI Reference*. **Note:** Configuration backups should be taken *only* when the ION Accelerator system is in a healthy state.

BASIC TASK FLOW

Below is a list of the basic ION Accelerator tasks and the section of this guide that explains each one.

GUI Guide Section	Tasks
Basic Tasks and the Overview Tab (this section)	<ul style="list-style-type: none">• Getting Help, logging out• Changing the admin password• Viewing summary and slot information• Viewing real-time performance metrics• Updating software• Performing and saving basic or extended searches for ION elements
Setting up Storage	<ul style="list-style-type: none">• Choosing a storage profile to balance performance and reliability• Creating and removing storage pools for volumes• Performing basic or enhanced searches (applies to all configuration screens)
Configuring Volumes	<ul style="list-style-type: none">• Creating or removing volumes• Expanding volume capacity
Managing Initiators	<ul style="list-style-type: none">• Setting up and managing initiator groups and access• Assigning initiator groups to volumes• Adding, editing, or removing initiators





Configuring Targets	<ul style="list-style-type: none">• Viewing target information• Creating a target alias
Managing ioMemory	<ul style="list-style-type: none">• Getting information about the ioMemory modules currently deployed in your ION Accelerator appliance• Saving searches for ioMemory attributes
Getting ION Accelerator Host Information	<ul style="list-style-type: none">• Viewing information about the configured hosts• Collecting system logs• Shutting down the ION Accelerator appliance• Restarting the appliance (<code>system:restart</code> in CLI)• Using the chassis monitor URL (<code>node:list</code> in CLI)
HA and Configuring Clusters	<ul style="list-style-type: none">• Understanding HA concepts and configurations• Selecting and configuring HA hardware components for Fibre Channel or iSCSI• Managing information in a configured HA cluster
Monitoring ION Accelerator Performance	<ul style="list-style-type: none">• Viewing and analyzing real-time performance statistics, with Performance Overview graphs and Live Meter• Creating custom reports for performance attributes, including IOPS, bandwidth, temperature, and endurance
Handling ION Accelerator Alerts	<ul style="list-style-type: none">• Understanding and managing alerts: error, warning, and informational• Displaying or archiving system alerts for errors, warnings, and informational conditions
Configuring ION Accelerator Settings	<ul style="list-style-type: none">• Viewing network information for ports• Setting up remote access, user accounts, and alert rules and subscribers• Configuring SMTP Server and SNMP notifications
Appendixes	<ul style="list-style-type: none">• Details for system alert rules and alert parameters• SNMP MIB information



OVERVIEW SCREEN

After login, the Overview screen appears. (The Capacity section displays “No Storage Pool” until a storage pool has been configured.) The two basic areas are the Tabs bar (at the top) and the Overview screen (the main portion of the Overview tab), each described in this section.

-  The HA example below shows tabs for two HA nodes (middle of the screen). Only one tab is available for standalone appliances.
-  Using multiple browser windows for the same ION Accelerator host is not supported.





TABS BAR

The Tabs bar appears at the top of the Overview screen:



The **Overview**, **Configuration**, **Alerts**, and **Settings** tabs help you manage your ION Accelerator appliance. These tabs are each described in later sections in this guide.

Additionally, there are Admin | Logout | Help links that are described below, as well as a basic Search function (described in [Managing Initiators](#)).

Help

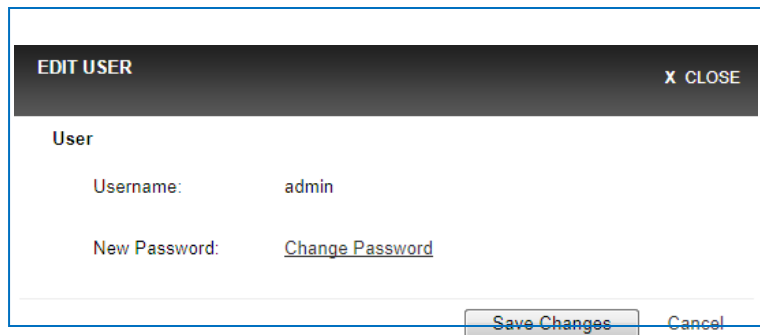
Clicking Help in the upper-right corner of the tabs bar displays the following choices for help:

- Fusion-io Knowledge Base
- Fusion-io Support

Changing the Admin Password

To change the admin password,

1. Click the **Admin** link in the upper-right corner of the tabs bar. The **Edit User** dialog appears.



2. Click the **Change Password** link. The dialog now shows password and confirmation fields.

A dialog box titled "EDIT USER" with a close button "X CLOSE" in the top right corner. The dialog contains a section titled "User" with the following fields: "Username:" with the value "admin", "Old password:" with an empty text input field, "New password:" with an empty text input field, and "Confirm new password:" with an empty text input field. At the bottom right of the dialog are two buttons: "Save Changes" and "Cancel".

3. Fill in the "Old password", "New password", and "Confirm new password" fields.
4. Click **Save Changes** to update the admin password.

Logout

To log out from the ION Accelerator, click **Logout** in the upper-right corner of the menu bar.

Legal Information

To display information about Fusion-io trademarks and related items, click the **Legal** link in the lower-right corner of the screen.

© 2014 Fusion-io, Inc. | Version 3.10.0.23 [Legal](#)



OVERVIEW SCREEN DETAILS

The Overview screen is divided into the Summary, Slot, and Performance areas.

Summary Area

A sample Summary area is shown below.



- Summary – Shows the host name of the appliance (or cluster name, if in HA mode), the IP address of the server hosting ION Accelerator (or the cluster IP address, if in HA mode), the version on software currently running, and the Update Software link (see [Updating Software](#)). In a single-server configuration, clicking the host name displays the ioMemory Configuration screen; in HA configurations, details are available in the Host tab (see *Slot Area* below) for each cluster node.
- Volumes and Initiators – Number of volumes and initiators that have been configured
- Capacity – Available (green) on the storage pool for creating volumes; and configured (gray) space for the entire appliance. If no storage pool has been created, Capacity indicates that condition:

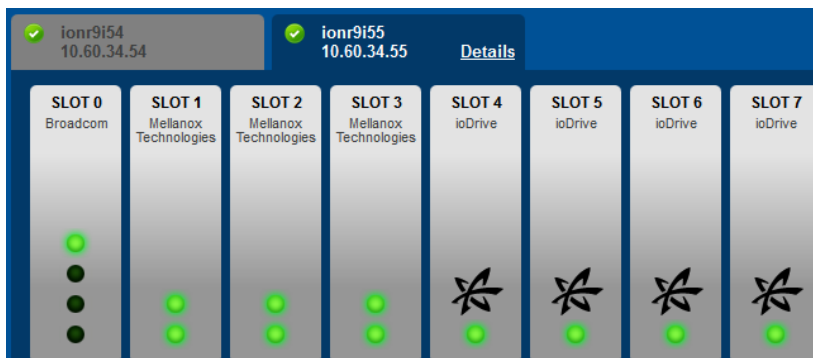


OR



Slot Area

A sample slot diagram for an HA system is shown below (standalone appliances have one tab).





Host tabs (HA only) – Click a tab to display the slot configuration for the selected host. On a tab, you can click the **Details** link to display the Host Configuration screen.

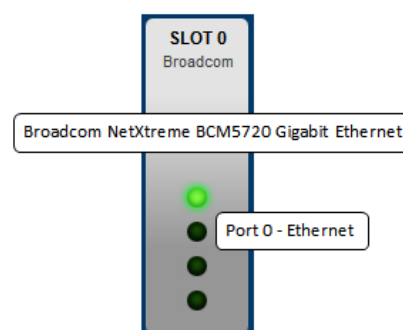
- Slot Usage – ioMemory devices or network fabric cards are indicated for each slot. The status light in the slot icon indicates functioning (green), or a problem (red), or an offline condition (red). Unused slots are indicated by dashed outlines.



Slot numbers listed here are intended to match the physical locations of the slots in the server.

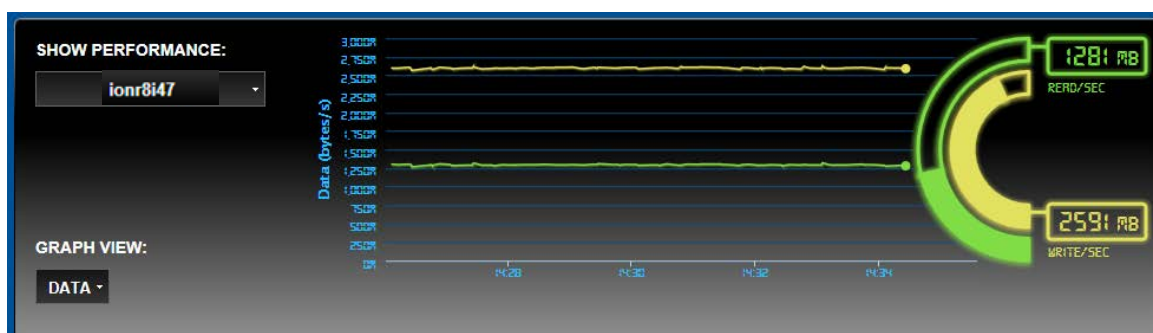
- Details – For HA, click the **Details** link to display the Configure access tab for the selected host. (For standalone, click the Host screen for the server to get similar information.) See [ioMemory Configuration](#) in *Managing ioMemory* for details.

- To see port numbering information, place the cursor over the desired port icon at the bottom of any CNA slot diagram. To see adapter information, place the cursor over the desired title description at the top of any CNA slot diagram. The example at the right hovers over the Slot 0 title (Mellanox Technologies) and then the top port (green light).



Performance Area

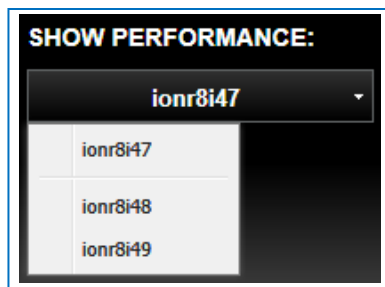
You can see a graphical view of current ION Accelerator performance in the Show Performance area at the bottom of the **Overview** tab.



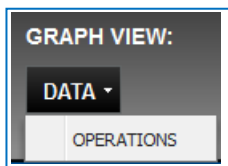
For details on the graphical elements, see [Performance Graphs \(Overview Tab\)](#) in *Monitoring ION Accelerator Performance*.



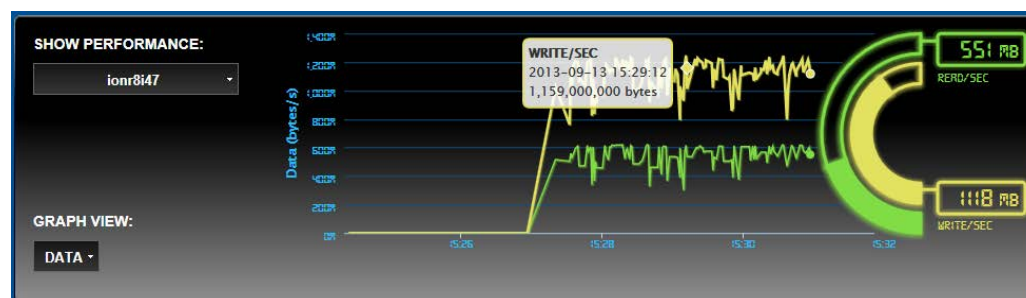
1. In the Show Performance drop-down list, select the node whose performance you want to monitor (multiple nodes are shown for HA). If a cluster exists, select it (first figure below) or one of its nodes (second figure).



By default, Data (bandwidth, or GB/sec) performance statistics are displayed. The examples in this section all show Data performance. To switch to IOPS performance statistics, select **Operations**.



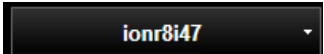

2. To display the read or write statistics for a given point in time, mouse over the yellow or green performance line. A popup appears, showing the statistics for that point in time.



This point-in-time performance display is also available for the “All ioMemory” options described below.

Selecting a Performance View

To display performance statistics for all ioMemory devices or CNAs in the ION host,

1. Click the host name box. 
2. Click the **ALL IOMEMORY** box below the host name. 
3. Select the device you want to monitor from the drop-down menu.



ALL IOMEMORY
SLOT 4 (1421D0AC3)
SLOT 5 (1421D0AC9)
SLOT 6 (1421D0AC2)
SLOT 7 (1421D0B8D)
ALL CNA
SLOT 0 - Broadcom
SLOT 1 - Mellanox Technologies
SLOT 2 - Mellanox Technologies
SLOT 3 - Mellanox Technologies



If an expansion chassis is used, the ioMemory device slot numbers show ION slot # - canister # - canister slot # (such as 4-1-6):

ALL IOMEMORY
SLOT 4-1-6 (1149D2709-1111, 1149D2709-1121)
SLOT 4-1-1 (409898, 409903)
SLOT 4-1-5 (425832, 425837)
SLOT 4-1-2 (500911, 501236)

- Choosing "Slot *n*" under ALL IOMEMORY shows performance for only the ioMemory module(s) in the selected slot.

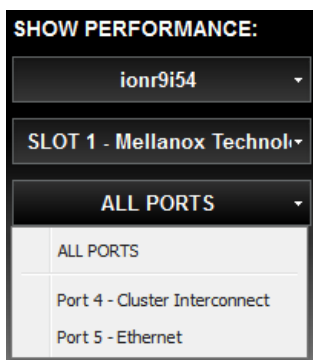
SHOW PERFORMANCE:

ionr9i54 ▾

SLOT 4 (1421D0B2F) ▾

ALL IOMEMORY MODULES ▾

- Choosing "All CNA" shows combined performance stats for all network devices.
- Choosing "Slot *n*" under ALL CNA shows combined performance for all ports connected to the network device in the selected slot. Or, you can track performance for one or all ports by clicking ALL PORTS:



For more information on interpreting ION Accelerator performance statistics, see [Monitoring ION Accelerator Performance](#).

UPDATING SOFTWARE



Software updates can also be done using the Command-Line Interface (CLI). For details, see *Quick Start Tasks: Software Update* in the *ION Accelerator Appliance CLI Reference Guide*.

When a new version of the ION Accelerator software becomes available, you can install it using the software update package (without using the ISO image on the installation DVD). Refer to the current *ION Accelerator Appliance Release Notes* on the [Fusion-io Support site](#) for any specific update restrictions or special instructions.

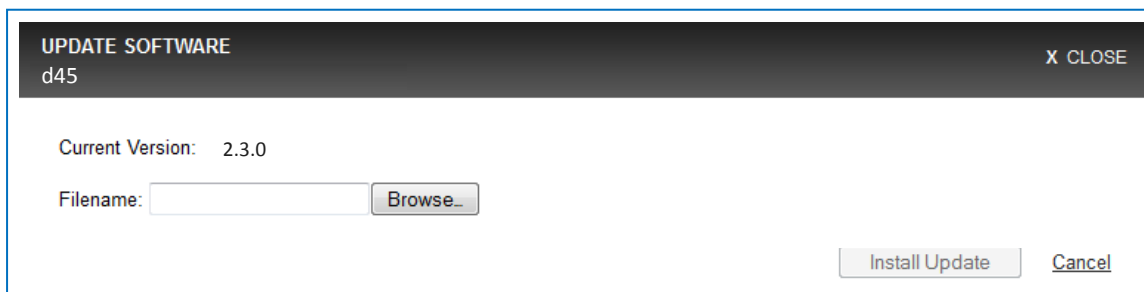
If you are updating the software for all nodes in an HA cluster, a *rolling* update is automatically done. When one node is being updated, its HA complement node goes into failback mode until the update finishes. This process continues until all nodes in the cluster are updated.



Do not make changes to HA configuration when the system is in a degraded state, such as when one node is down.

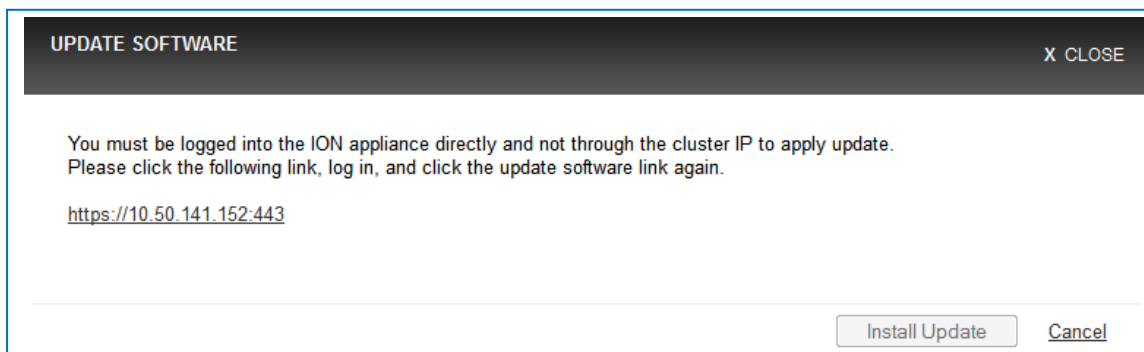
To update the software (firmware) on the appliance,

1. Visit the [Fusion-io Support website](#) for the latest software update package (.IOP file).
2. Save the .IOP file to the local computer (/tmp directory is recommended) from where you will be doing the software update.
3. Click the **Update Software** link in the Summary box. The Update Software dialog appears:





If this appliance is a secondary node connected to a cluster IP address, the browser will be redirected to the master node. For example:



In any case, the node *other* than the one you are connected to will be updated first (if you are connected to the master node, the secondary node updates first, and vice versa).

4. Click **Browse** and navigate to the update file (.IOP) you want to install.
5. Click **Open** in the File Upload dialog.

Data about the update file is included in the dialog, such as file version number, release date, build number, description, hotfix ID, reboot-required indicator, and estimated update time.

6. Click **Install Update** to update the software.

A notification message appears regarding the success of the update. A reboot may occur without prompting.

The browser will lose its connection to ION Accelerator. If you are updating cluster nodes, the browser will reconnect to the other (primary) node; then after that update finishes, its browser connection will also be lost.

7. When the browser connection is lost after the last update, wait for at least five minutes and then reconnect to the GUI.

If the update fails on either node, an error dialog will appear. You can then use the CLI to determine the state of the nodes in the cluster (see *Node Commands* in the *ION Accelerator Appliance CLI Reference Guide*).

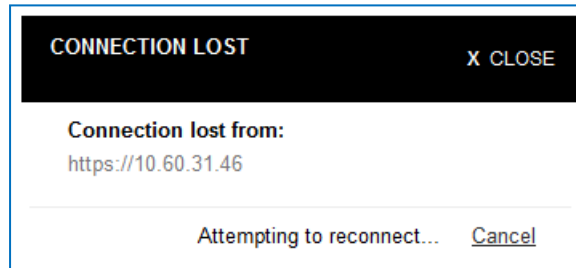
Reverting to a Previous Software Version

If it becomes necessary to revert to a previous version of the software, that must be done via the CLI, not the GUI. For instructions on reverting, see *soft:revert* in *Software Commands* in the *ION Accelerator Appliance CLI Reference Guide*.



HANDLING CONNECTION LOSS

If the network connection to an ION Accelerator host server is lost, the software automatically attempts to reconnect to it, as shown in the following dialog.



When you upgrade the ION Accelerator software on Node 1 of an HA cluster, that connection will be lost and will need to be re-established.



Setting up Storage

Setting up a storage pool is required before you can create volumes for data. You can do this either through the GUI (as explained below) or with the CLI (see *Quick Start Tasks: Management* in the *About the Command-Line Interface (CLI)* section of the *ION Accelerator Appliance CLI Reference Guide*. There are a few considerations in choosing between the GUI and CLI for create a storage pool:

- You can create multiple storage pools with either the GUI or the CLI.
- Commands for adjusting RAID configurations are found in the CLI but not in the GUI.



See *Naming Requirements* at the end of this section for rules on choosing names for storage pools, volumes, initiators, initiator groups, aliases, and targets in ION Accelerator.

ABOUT STORAGE POOLS FOR ION ACCELERATOR

Four types of storage pools can be created, each with its own storage profile (description of the pool type). These storage profiles are described below.

Storage Profile Types

The basic types of storage profiles are described below. In each case you can click the “More Details” link next to the profile description to get additional information.

- *Reliable Performance* (default) – Reliability and performance are emphasized over capacity, using a RAID 10 configuration. Storage is divided into two equal segments that are mirrored to each other, so that an unlikely failure of an ioMemory module will not result in data loss. This configuration requires a minimum of four ioDrives or additional increments of two ioDrives, which must all be the same type and capacity.
- *Maximum Performance* – Performance is emphasized, using a RAID 0 configuration. This does *not* provide redundant storage. With this configuration, the storage capacity is striped across the available ioDrives (minimum 2) installed in the server. All ioDrives in this profile must be of the same capacity.



- *Reliable Capacity* – Capacity is emphasized over performance and fault tolerance, employing a RAID 5 configuration. A single ioDrive failure can be sustained without loss of data, and read performance is better than write performance. *At least three ioDrive devices* are required, and they must all be of the same type and capacity.



The Reliable Capacity option is supported only in standalone mode, not HA.

- *Direct Access* – Maximum capacity is emphasized, similar to a JBOD storage configuration, without redundant storage or striping. In Direct Access mode, each ioMemory module is presented as an individual storage pool. This option uses host/appliance/application-based logical volume management instead of using this appliance's logical volume management.



The available capacity is affected by the storage profile you choose. For each profile, RAID configuration and overhead is factored into the available capacity displayed.

Naming Conventions for Storage Pools

The default storage pool name is "storagepool-#" where "#" is 1 or the next unused number. You can change any storage pool name according to the requirements listed below.

Naming Requirements

When you choose names for storage pools, volumes, initiators, initiator groups, aliases, or targets, they must follow these rules:

- Only alphanumeric characters (letters and numbers), dashes, and underscores may be used.
- There is a 16-character maximum for names.
- Any combination of lowercase or uppercase letters may be used.
- Names must begin with a letter (not a digit, dash, or underscore).
- Names may not be duplicated within the ION Accelerator appliance.

HA Considerations

Storage profiles that are based on HA configurations may have slightly different characteristics. With two-node HA clusters, identical pools are created on each node, and the pool name will be the same for each.



CREATING A STORAGE POOL

In the Storage Pools screen (Configuration tab, Storage Pools link at the left), one or more storage pools can be set up from the raw ioMemory drives. The initial Storage Pools screen is shown below.

STORAGE POOLS							Enhanced Search
+ Add Storage Pool							Columns
Storage Pool	Status	Storage Profile	Available Capacity	Configured Capacity	Volumes	Delete	
No results found							
Page 1 of 1						No data to display	

You can adjust the width of any column by dragging the divider bar of the adjacent column.

To create a new storage pool, click the **Add Storage Pool** link. The Add Storage Pool dialog appears, allowing you to first choose a storage profile that best suits your needs.

If you are not familiar with the storage profiles used by ION Accelerator, review [Storage Profile Types](#) and [HA Considerations](#) before configuring the storage pool.

ADD STORAGE POOL X CLOSE

Name:

STORAGE PROFILE

Maximum Performance

Reliable Performance

Reliable Capacity

Direct Access

Pass the ioDrives through as raw capacity, allowing another application to do the volume management. ([More Details](#))

IOMEMORY SELECTION

Each ioMemory module will be exposed as a storage pool. [Change Selection](#)

ion-3pwax4nc		ion-chn972m8	
SLOT 4	SLOT 5	SLOT 6	SLOT 7
ioDrive	ioDrive	ioDrive	ioDrive
3 TB	3 TB	3 TB	3 TB

Number of storage pools: 4

Number of storage pools: 4



1. Type a name for the storage pool in the Name field. (For Direct Access, the name defaults to "storagepool-n", depending on the number of existing pools.)
2. Select a storage profile type: Maximum Performance, Reliable Performance, Reliable Capacity, or Direct Access. Click the **More Details** link if you need more information on the profile type.



For all types except Direct Access, a star-rating chart is displayed that shows how the selected type favors performance, reliability, or capacity. For example:

Reliable Performance
Performance and capacity are important, but it must be fault tolerant. ([More Details](#))

Performance: ★ ★ ★ ☆

Reliability: ★ ★ ★ ★

Capacity: ★ ☆ ☆ ☆

3. If you selected any Storage Profile type besides Direct Access, a drop-down appears so you can specify the capacity of ioMemory to use in the storage pool. Note any requirements listed next to the drop-down menu as you make the selection. For example:

IOMEMORY SELECTION

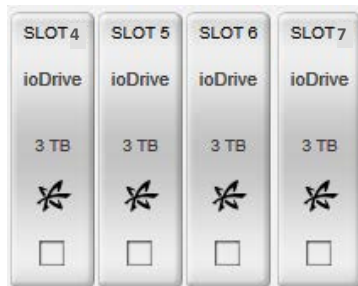
Capacity: 6 TB (6 TB available) *i* Required: 2 x ioDrive 2 (3 TB) per host

[Change Selection](#)

4. If you want the new storage pool to use the ioDrives that are currently pictured in the slot diagrams, click **Add** to finish creating the pool and proceed to *Storage Pool Information* below.

Or

In the ioMemory Selection area, click the **Change Selection** link to specify the ioDrives for the new pool. The slot icons for any available (not in use) ioDrives now appear with selection boxes, as in the example below, which has four available ioDrives for the new storage pool:





5. Select the ioDrives you want to include in the new storage pool. (If you want to return to the original drive selection, click the **Use Default Selection** link that has replaced the Change Selection link.)
6. Click **Add** to create the storage pool.

When you have decided on the type of storage profile you want to use, select it in the dialog and click **Configure** to continue. The Storage Pools screen appears, displaying the newly created pool.

The screenshot shows the 'STORAGE POOLS' interface with an 'Enhanced Search' dropdown. Below the title is a '+ Add Storage Pool' button and an 'Edit Columns' link. A table lists one storage pool: 'storagepool-1' with an 'EDIT' button, 'Online' status, 'Maximum Performance' profile, '5999.82 GB' available capacity, '0.00 GB' configured capacity, and '0' volumes. A 'Delete' button is present. The footer shows 'Page 1 of 1' and 'Displaying 1 - 1 of 1'.

Storage Pool	Status	Storage Profile	Available Capacity	Configured Capacity	Volumes	Delete
storagepool-1 EDIT	Online	Maximum Performance	5999.82 GB	0.00 GB	0	

You can add more storage pools (see [Creating a Storage Pool](#) previously), so long as there is available capacity. A given ioMemory module can belong to only one pool.

STORAGE POOL INFORMATION

A sample Storage Pools screen is shown below, with two storage pools already set up.

The screenshot shows the 'STORAGE POOLS' interface with an 'Enhanced Search' dropdown. Below the title is a '+ Add Storage Pool' button and an 'Edit Columns' link. A table lists two storage pools: 'storagepool-1' and 'storagepool-2'. 'storagepool-1' has 'Reliable Performance' profile, '809.66 GB' available capacity, '1600.00 GB' configured capacity, and '16' volumes. 'storagepool-2' has 'Maximum Performance' profile, '409.92 GB' available capacity, '2000.00 GB' configured capacity, and '16' volumes. Both have 'Online' status and 'Delete' buttons. The footer shows 'Page 1 of 1' and 'Displaying 1 - 2 of 2'.

Storage Pool	Status	Storage Profile	Available Capacity	Configured Capacity	Volumes	Delete
storagepool-1 EDIT	Online	Reliable Performance	809.66 GB	1600.00 GB	16	
storagepool-2 EDIT	Online	Maximum Performance	409.92 GB	2000.00 GB	16	

The following information columns are available:

- Storage Pool – Name of the storage pool. Click **Edit** to change the name of an existing pool.
- Status – Indicates whether the storage pool is online or offline; also indicates whether there are any warning or error conditions, such as with volumes
- Storage Profile – Type of profile: Reliable Performance, Maximum Performance, Reliable Capacity, or Direct Access
- Available Capacity – Total usable capacity for adding new volumes to the storage pool.
- Configured Capacity – Total capacity configured into volumes.



- Volumes – Number of volumes currently belonging to this storage pool. To view the volume(s), click the link in this column. See the [Configuring Volumes](#) section for details.
- Delete – You can delete a storage pool *only* when all volumes have first been deleted from it. Click the red icon to mark the storage pool for deletion, and then click **Confirm Delete**.

COLUMNS (STORAGE POOLS)

The default columns for the Storage Pools screen are shown below. To change the columns that are displayed, click the **Columns** link and clear or check the boxes as desired. Then click **Update Columns** to save the changes.



You can also use the basic Search feature and the Enhanced Search tab to find attributes in your ION appliance that correspond to the column entries. See [Basic Search](#) and [Enhanced Search](#) below.

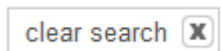
BASIC SEARCH

The basic Search feature is available in the Tabs bar, on the main Configuration and Alerts screens. To perform a basic search,

1. Click the “Search <item>” box at the right of the Tabs bar.



2. Type the term you want to search for and press **Enter**. The results list on the screen will be filtered to contain only entries with the search item you specified.
3. To clear the search results and return to the unfiltered list, click **clear search**.





ENHANCED SEARCH

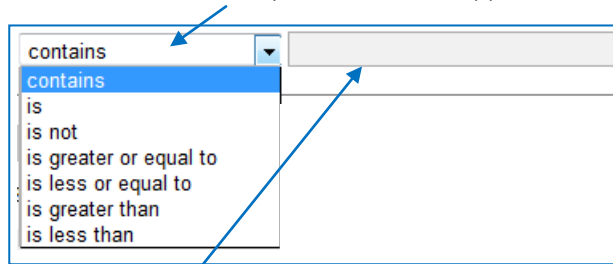
The Enhanced Search feature, available from each Configuration screen, enables you to find ION Accelerator elements (initiators, devices, volumes, targets, etc.) that match the attributes that you specify.

To use Enhanced Search,

1. Click the **Enhanced Search** tab at the upper-right corner of the Configuration screen area. The **Choose Attribute** button appears:

Search:

2. Click the **Choose Attribute** button and select an attribute to search for, from the drop-down menu of attributes.
3. In the “condition” drop-down list that appears, select the condition for your search.



4. In the values box, type a search value. For example:


Search: is

5. Click **Apply** to begin the search. The results are displayed in the window.

The search parameters remain active in the window so you can repeat the search.

6. To start a new search, click “clear search” and click the **Enhanced Search** tab again.

NAVIGATION AND REFRESH

Screens available from the **Configuration** tab have built-in navigation and refresh aids. To scroll among pages of entries, use the navigation buttons at the bottom of the entry list. To refresh the screen view, click the Refresh icon ().

Multi-page scrolling and refresh are also available at the bottom of other screens in the GUI.



Configuring Volumes

VOLUME INFORMATION

To configure volumes in an existing storage pool, click the **Volumes** link on the Configuration tab. The Volumes screen appears, similar to the one shown below (if volumes are already set up).

VOLUMES							Enhanced Search
Volume Name	Status	Capacity	Storage Pool	Active Initiators	Active Targets	Preferred Cluster Node	Delete
+ Add Volume						Edit Columns	
ion48_p1_v1	Online	100.00 GB +	pool_1	4 of 4 EDIT	4 of 4	ionr8i48	Delete
ion48_p1_v2	Online	100.00 GB +	pool_1	4 of 4 EDIT	4 of 4	ionr8i48	Delete
ion48_p1_v3	Online	100.00 GB +	pool_1	4 of 4 EDIT	4 of 4	ionr8i48	Delete
ion48_p2_v1	Online	100.00 GB +	pool_2	4 of 4 EDIT	4 of 4	ionr8i48	Delete
ion48_p2_v2	Online	100.00 GB +	pool_2	4 of 4 EDIT	4 of 4	ionr8i48	Delete
ion48_p2_v3	Online	100.00 GB +	pool_2	4 of 4 EDIT	4 of 4	ionr8i48	Delete
ion48_p3_v1	Online	100.00 GB +	pool_3	4 of 4 EDIT	4 of 4	ionr8i48	Delete
ion48_p3_v2	Online	100.00 GB +	pool_3	4 of 4 EDIT	4 of 4	ionr8i48	Delete
ion49_p1_v1	Online	100.00 GB +	pool_1	4 of 4 EDIT	4 of 4	ionr8i49	Delete
ion49_p1_v2	Online	100.00 GB +	pool_1	4 of 4 EDIT	4 of 4	ionr8i49	Delete

Page 1 of 2 | Displaying 1 - 10 of 16

The following columns are displayed:

- Volume Name – Name of the volume as it was created
- Status – “Online” (); or “Disconnected”; or “Error” with an alert link (Error); or “Warning” with an alert link (Warning).
- Capacity – Number of gigabytes allocated to the volume, including metadata. Click the “plus” icon to expand the capacity (see [Expanding Capacity](#) below).



- Storage Pool – Name of the storage pool this volume belongs to
- Active Initiators – Link (such as “4 of 4”) to the initiators for this volume, followed by an Edit button for changing the initiator group assignment. For more information, see [Assigning an Initiator Group to a Volume](#) in the *Managing Initiators* section.
- Active Targets – Link to the target ports currently used to access this volume. (See the [Viewing Targets](#) section for details.)
- Preferred Cluster Node (HA only) – Link to the primary HA node for the volume. To see details about the preferred node and its active alerts (if any), click the corresponding link. (See [Host Configuration Details](#) in *Getting Host Information* for details.)
- Delete – Deletes the selected volume (see [Editing or Deleting a Volume](#) below).

ADDING A VOLUME



Volumes cannot be added if all the capacity of the storage pool has been used, or if one node of an HA cluster is down. With Fibre Channel, a maximum of 16 volumes can be used concurrently for HA and 96 for standalone mode. With iSCSI, 32 volumes for HA or 96 volumes for standalone mode can be used concurrently.

To add a volume in the storage pool,

1. Click the **Add Volume** link in the upper left of the Volumes screen. The Add Volume dialog appears:

ADD VOLUME X CLOSE

Storage pool: pool_3 (2009.92 GB available capacity)

NEW VOLUME

Name: volume-1

Capacity: 2009.92 GB

Preferred cluster node: Auto

+ Add Another Volume

Create Cancel

2. If you have multiple storage pools, select the one that the new volume should belong to from the Storage Pool drop-down list (near the top of the dialog).
3. Specify the Volume Name (maximum of 16 alphanumeric characters, including dashes or underscores, starting with a letter).



- Specify the capacity for the volume in GB. The minimum size is 1GB, and values may be entered to two decimal places.



The default is the maximum size of the pool, so make sure you set the size to a smaller amount if you don't want the volume to use all the available space.

- If clustering has been set up for the system, you can select a Preferred Cluster Node (the default is "Auto"). This capability is available only with the High Availability Feature.

"Preferred node" indicates which node will normally serve I/O to this volume. Here are some suggestions for choosing the preferred cluster node:

- If you know how active a volume is, try manually load balancing volumes across cluster nodes.
- If you don't know the activity rate but want to load-balance, alternate the preferred cluster node.
- If you prefer a completely active:passive configuration, place all volumes on one active cluster node.

- To add more volumes, click the **Add Another Volume** link in the dialog. Another "New Volume" area appears in the dialog where you can configure additional capacity.

ADD VOLUME X CLOSE

Storage pool: pool_3 (2009.92 GB available capacity)

NEW VOLUME

Name: volume-1

Capacity: 2000.00 GB

Preferred cluster node: Auto

NEW VOLUME Remove

Name: volume-2

Capacity: 5.00 GB

Preferred cluster node: Auto

+ Add Another Volume

Create Cancel

You can repeat the Add Volumes process in this dialog, with each new volume's name being incremented by 1 (volume0, volume1, etc.). To cancel creating a new volume, click the corresponding **Remove** link.

- When you have finished adding volumes, click **Create**.



EDITING OR DELETING A VOLUME

To edit the name of a volume,

1. Make sure no initiators have access to the volume in question. To take a volume offline, click **Edit** in the Active Initiators column and remove all initiator access.
2. Click the **Edit** button to the right of the Volume Name (first column).
3. Type the desired name for the volume.
4. Click outside the name field to save the new name.

To delete a volume,

1. Make sure no initiators have access to the volume in question. (If you have assigned initiators to the volume, remove all initiator access to the volume.)
2. Click the red trashcan icon at the right of the volume entry and follow the prompt.

EXPANDING CAPACITY

You can expand the size of a volume, up to its pool's allowable capacity limits. However, you cannot directly decrease a volume's size; to do that, you need to delete the volume (which deletes all its data) and then recreate it with a smaller capacity.

To expand a volume,

1. Click the "plus" icon to the right of the capacity total for the volume. The Expand Volume dialog appears, showing the current capacity in GB.
2. Type the new size in the Capacity field, which may include up to two decimal places. This enables the **Expand** button in the dialog.

EXPAND VOLUME X CLOSE
Volume: v1
Capacity: 25.00 GB
Expand Cancel



The resulting value must not cause the volume to exceed the total capacity for the storage pool.

3. Click **Expand**.



COLUMNS AND SEARCH (VOLUMES)

The default columns for the Volume screen are shown below. To change the columns that are displayed, click the Columns link and clear or check the boxes as desired. Then click **Update Columns** to save the changes.

EDIT COLUMNS

- Status
- Capacity
- Storage Pool
- Active Initiators
- Active Targets
- Preferred Cluster Node
- SCSI Device ID
- Unit Serial Number

The SCSI Device ID is a combination of the Unit Serial Number and the Volume Name, joined by a dash. For example: 7235e4e6-dot104_rhel_v1

You can also use the basic Search feature and the Enhanced Search tab to find attributes in your ION appliance that correspond to the column entries. See [Basic Search](#) and [Enhanced Search](#) earlier in this guide.



Managing Initiators

Initiator nodes are computers that can gain access to ION Accelerator shared storage. You can create, edit and remove initiator ports as part of your configuration.

To begin managing initiators for the ION Accelerator appliance,

1. Click the **Configuration** tab.
2. Click the **Initiators** link at the left side of the window. The Initiators screen appears, similar to the ones shown below.



The software attempts to auto-discover initiators, so they may already appear in the Initiators screen. Auto-discovered initiators have names that are identical to the port WWPN or IQN.

Below is a Fibre Channel example, with WWN identifiers:

INITIATORS							Enhanced Search ▾
Name	Status	WWPN	Volumes	Initiator Group	OS	Delete	
21:00:00:24:ff:6a:8	Inactive	21:00:00:24:ff:6a:82:9c	0	EDIT		🗑️	
21:00:00:24:ff:6a:8	Inactive	21:00:00:24:ff:6a:82:9d	0	EDIT		🗑️	

Here is an iSCSI example, with IQN identifiers:

Name	Status	IQN	Volumes	Initiator Group	more ...
w2k8_1 EDIT	Active	iqn.1991-05.com.microsoft:win-6scut6f015d#192.168.10.8	16	W2K8 EDIT	
w2k8_3 EDIT	Active	iqn.1991-05.com.microsoft:win-6scut6f015d#192.168.10.9	16	W2K8 EDIT	



The following columns are displayed:

- Name – Name (identifier or alias) of the initiator. If an alias has been created for the name, it appears at the left.
- Status – Online (green icon) or offline
- <Identifier> – WWPN or IQN for the initiator port
- Volumes – Number of volumes that are currently accessible by this initiator. Clicking this link displays the Volumes screen.
- Initiator Group – Group that this initiator has been assigned to. All members of a group have the same access rights to shared storage volumes on targets.
- OS – Type of operating system used on the initiator: AIX or “Other”. (HA is supported on AIX only with Fibre Channel.)
- Delete – Click the red trashcan icon to delete the corresponding initiator.

CREATING INITIATOR GROUPS

An initiator group controls which initiators can see exported volumes (LUNs). When an initiator group is assigned to a volume, all (and only) those initiators in the group can access the volume.



You can also create and add individual initiators (see [Adding Individual Initiators](#) later in this section), but in most cases it is more effective to set up initiator groups first, to coordinate larger-scale initiator access.

To create or manage an initiator group,

1. Click an **Edit** button in the Initiator Group column. If no Group name appears to the left of the button, that means you’re creating the Group; otherwise, you’re editing the group name in the column. The Manage Initiator Group dialog appears:

The screenshot shows a dialog box titled "EDIT INITIATOR GROUP" with a close button "X CLOSE". The dialog contains two input fields: "Initiator group:" and "OS:". The "Initiator group:" field has a dropdown menu with "rhel119" selected and "Assign to new group" as an option. The "OS:" field has a dropdown menu with "rhel119" selected. At the bottom right, there are "Save" and "Cancel" buttons.



2. If you are creating a *new* initiator group, type its name in the “Group name” field.

Initiator group:	Assign to new group
Group name:	initiatorgroup-1
OS:	-- Select --



Do not use spaces in the initiator group name, as that may cause problems with group creation.

Or

If you are assigning an initiator to an *existing* group, use the drop-down menu in the “Initiator group” field to select the initiator group that this initiator will be assigned to.

iogrp1
Assign to new group
iogrp1

3. Click **Save**.
4. Read the warning prompt in the confirmation dialog that explains how initiator access is affected by Groups; then click **Confirm Save**.



Initiators sometimes may not auto-discover LUNs mapped from ION Accelerator. To view LUNs you need to run `rescan-scsi-bus.sh` (Linux) or Rescan Disks (Windows).

ASSIGNING AN INITIATOR GROUP TO A VOLUME



An individual initiator cannot be added to a volume; only an initiator group may be added.

To assign the active initiators for volumes,

1. Click the **Configuration** tab.
2. Click the **Volumes** link at the left to display the Volumes screen.

Volume Name	Status	Capacity	Storage Pool	Active Initiators	Active Targets	Preferred Cluster Node	Delete
ion48_p1_vol1	Online	100.00 GB	pool_1	4 of 4 EDIT	4 of 4	ionr8i48	

3. Click the **Edit** button in the **Active Initiators** column (circled above) that corresponds to the volume you want to update. The **Edit Initiator Access** dialog appears.



EDIT INITIATOR ACCESS
Volume: ion48_p1_vol1

Block size: 512B 4K

Initiator Group: W2K8

ionr8i48 ionr8i49

All Targets All Targets

All Targets All Targets

Submit Cancel

Select an initiator group from the Initiator Group list.



To avoid confusion, use a different naming scheme for initiators and groups, so you can easily tell them apart and not unintentionally alter one or the other.

4. Select the block size appropriate for your application.



Block size for most applications should be set to 512B.

5. Select the target ports in the drop-down list(s) for the host(s) you want this initiator to access. (By default, all the target ports are selected.)

The first example below shows a selection list from the first ION Accelerator host in an HA cluster (IONr1i45) using Fibre Channel. Two ports (identified by WWPNs) are selected (green) for the IONr1i45 host. (To see the entire IDs on screen, scroll to the right.) You can also select “All Targets” or select different target ports.

IONr1i45 IONr1i44

Multiple Multiple

All Targets

21:00:00:24:ff:67:5f:60 (21:00:00:)

21:00:00:24:ff:67:5f:61 (21:00:00:)

21:00:00:24:ff:67:5f:62 (21:00:00:)

21:00:00:24:ff:67:5f:63 (21:00:00:)

Submit

6. If you want to remove (block) *all* access for an initiator group, click the red trashcan icon at the right of the configuration row. (This does not delete the initiator itself.)

7. Click **Submit** to grant initiator access.



ADDING INDIVIDUAL INITIATORS

To add a single initiator to an ION Accelerator node,

1. Click the **Add Initiator** link. The Add Initiator dialog appears, with the first field as WWPN for Fibre Channel, or IQN for iSCSI:

ADD INITIATOR X CLOSE

WWPN:
Example: f8:e9:d2:c3:b4:a5:e6:f7

Name: (optional)

Submit Cancel

2. Specify the port address. This is the WWPN or IQN.
3. Optionally specify a name for the initiator, up to 10 alphanumeric characters. The alias will appear in the Name column of the Initiators screen.
4. Click **Submit**.



iSCSI initiators are not auto-discovered; they must be manually added.

EDITING THE INITIATOR NAME

To edit an initiator name,

1. Click the **Edit** button to the right of the name (in the Name column).

n1p1 (10:00:00:05:33:64:71:98) EDIT

2. Type the desired name for the initiator.
3. Click outside the name field to save the new name.

DELETING AN INITIATOR

To delete an existing initiator,

1. Make sure the initiator is not active on the network fabric.
2. Create a new temporary initiator group, such as "Remove", and add the initiator to that group. See *Creating an Initiator Group* earlier in this section for details.
3. Click the red trashcan icon at the right of the row that corresponds to your temporary group. A confirmation similar to the following appears:



Delete initiator "n1p1 (10:00:00:05:33:64:71:98)"?

Confirm Delete

Cancel

4. Click **Confirm Delete** to remove the initiator from any groups to which it was assigned.

COLUMNS AND SEARCH (INITIATORS)

The default columns for the Initiators screen are shown below. To change the columns displayed,

1. Click the Columns link and clear or check the boxes as desired.

EDIT COLUMNS	
<input checked="" type="checkbox"/>	Status
<input checked="" type="checkbox"/>	Identifier
<input checked="" type="checkbox"/>	Accessible Volumes
<input checked="" type="checkbox"/>	Initiator Group
<input checked="" type="checkbox"/>	OS

2. Click **Update Columns** to save the changes.

You can also use the basic Search feature and the Enhanced Search tab to find attributes in your ION Accelerator appliance that correspond to the column entries. See [Basic Search](#) and [Enhanced Search](#) earlier in this guide.



Viewing Targets

Targets are accessible ports on the ION Accelerator appliance that can be used to attach directly to host interface ports or network switches. To view targets in the storage pool, click **Targets**. The Targets screen appears, similar to the one shown below (if you have already set up targets). The example below is for Fibre Channel:

TARGETS							Enhanced Search
Name	Target Port	Status	Link Speed	Identifier	Volumes	Hostname	Edit Columns
21:00:00:24:ff:6a:84:d4 EDIT	Slot 3, Port 1	✔ Connected	8 Gbit/s	21:00:00:24:ff:6a:84:d4	1	ion-fst0wcej	
21:00:00:24:ff:6a:84:d5 EDIT	Slot 3, Port 2	✔ Connected	8 Gbit/s	21:00:00:24:ff:6a:84:d5	1	ion-fst0wcej	
21:00:00:24:ff:6a:84:d6 EDIT	Slot 3, Port 3	✔ Connected	8 Gbit/s	21:00:00:24:ff:6a:84:d6	1	ion-fst0wcej	
21:00:00:24:ff:6a:84:d7 EDIT	Slot 3, Port 4	✔ Connected	8 Gbit/s	21:00:00:24:ff:6a:84:d7	1	ion-fst0wcej	
21:00:00:24:ff:6a:84:e4 EDIT	Slot 3, Port 1	✔ Connected	8 Gbit/s	21:00:00:24:ff:6a:84:e4	1	ion-uaexd4wi	
21:00:00:24:ff:6a:84:e5 EDIT	Slot 3, Port 2	✔ Connected	8 Gbit/s	21:00:00:24:ff:6a:84:e5	1	ion-uaexd4wi	
21:00:00:24:ff:6a:84:e6 EDIT	Slot 3, Port 3	✔ Connected	8 Gbit/s	21:00:00:24:ff:6a:84:e6	1	ion-uaexd4wi	
21:00:00:24:ff:6a:84:e7 EDIT	Slot 3, Port 4	✔ Connected	8 Gbit/s	21:00:00:24:ff:6a:84:e7	1	ion-uaexd4wi	

Page 1 of 1 | Displaying 1 - 8 of 8

iSCSI entries will show IQN identifiers, such as:

```
iqn.2007-02.com.fusion:sn.2m232406fw:eth6
```



The following columns are displayed:

- Name of the target. This is the same as the Identifier filed, unless it is modified.
- Target Port – Lists the port number
- Status – Online (green icon) or “Host Offline”
- Link Speed – Data transfer rate of the link, in GB/sec
- <Identifier> – WWPN for Fibre Channel, or IQN for iSCSI
- Volumes – Number of volumes being accessed through this target.
- Hostname (HA only) – Name of the host (cluster node) associated with this target port. Clicking the link displays details for the host (see [Host Configuration Details](#)).

CREATING AN ALIAS FOR A TARGET PORT

You can create an alias for a target port, to provide an identifier that’s easier to read and remember.

1. Click the **Edit** button in the Identifier column that corresponds to the target port for the added alias.
2. Type the alias name for the port. This alias name must be unique in the ION Accelerator appliance – no duplication of the alias is allowed.
3. Click outside the edit box to finalize the name.

The alias now appears as the primary identifier for the target, and the WWPN or IQN appears in parentheses next to it.

COLUMNS AND SEARCH (TARGETS)

The default columns for the Targets screen are shown below. To change the columns that are displayed, click the Columns link and clear or check the boxes as desired. Then click **Update Columns** to save the changes.

EDIT COLUMNS

- Target Protocol
- Firmware Version
- Target Port
- Status
- Link Speed
- Identifier
- Volumes
- Hostname

You can also use the basic Search feature and the Enhanced Search tab to find attributes in your ION Accelerator appliance that correspond to the column entries. See [Basic Search](#) and [Enhanced Search](#) earlier in this guide.



Managing ioMemory

You can manage the individual ioMemory devices in your host appliance by using the ioSphere GUI. To do so, click the ioMemory link in the Configuration screen. The ioMemory window appears, similar to the one shown below.

IOMEMORY							Enhanced Search
ioMemory	Status	Hostname	Storage Pool	Reserve Space	ioMemory S/N	Filesystems	Cluster Name
1337D0008-1111	R 39 MB/sec W 139 MB/sec	ion-r6-dl38...	storagepool-1	100.00 %	1337D0008...		ion-r6-dl380-ha
1337D0008-1121	R 0 MB/sec W 206 MB/sec	ion-r6-dl38...	storagepool-1	100.00 %	1337D0008...		ion-r6-dl380-ha
1337D005D-1111	R 41 MB/sec W 139 MB/sec	ion-r6-dl38...	storagepool-1	100.00 %	1337D005D...		ion-r6-dl380-ha
1337D005D-1121	R 0 MB/sec W 206 MB/sec	ion-r6-dl38...	storagepool-1	100.00 %	1337D005D...		ion-r6-dl380-ha
1337D00B5-1111	R 0 MB/sec W 190 MB/sec	ion-r6-dl38...	storagepool-2	100.00 %	1337D00B5...		ion-r6-dl380-ha
1337D00B5-1121	R 131 MB/sec W 148 MB/sec	ion-r6-dl38...	storagepool-2	100.00 %	1337D00B5...		ion-r6-dl380-ha
1337D001A-1111	R 109 MB/sec W 137 MB/sec	ion-r6-dl38...	storagepool-1	100.00 %	1337D001A...		ion-r6-dl380-ha
1337D001A-1121	R 33 MB/sec W 200 MB/sec	ion-r6-dl38...	storagepool-1	100.00 %	1337D001A...		ion-r6-dl380-ha
1337D00A0-1111	R 108 MB/sec W 137 MB/sec	ion-r6-dl38...	storagepool-1	100.00 %	1337D00A0...		ion-r6-dl380-ha
1337D00A0-1121	R 33 MB/sec W 200 MB/sec	ion-r6-dl38...	storagepool-1	100.00 %	1337D00A0...		ion-r6-dl380-ha

The following columns are displayed:

- ioMemory – ID of the ioMemory device. Clicking the ID link displays information about the device and actions you can perform. For details, see *ioMemory Configuration* below.



- Status – Real-time information on the read and write performance of the device, in MB/sec. If the device is unavailable, the Status is indicated as “Host Offline”. A red icon indicates an error condition; you can click the icon to view the Alert information.
- Hostname – Link to the ioMemory Configuration screen for this device. For details, see *ioMemory Configuration* below.
- Storage Pool – Name of the storage pool that this ioMemory device is assigned to
- Reserve Space – Amount of reserve space still available, as a percentage from 0 – 100%
- ioMemory S/N – Serial number of the ioMemory device.
- Filesystems – Name of the filesystem this ioMemory device is using, if any
- Cluster Name – ID of the cluster this device is a part of (if any)

IOMEMORY CONFIGURATION

The screen below shows sample configuration details for a selected host (alias 1150D0031-1111 in this example). The information fields and actions for this screen are described below.



This screen has additional access tabs: **Live**, **Reports**, and **Info**. These tabs are explained later in this section.

The screenshot displays the configuration interface for a selected host. The host name is **ionr9i54 - 1421D0B2F**. The interface includes a sidebar with a list of hosts, where **1421D0B2F** is selected. The main content area shows configuration options for the selected host, organized into sections:

- Settings**
 - ioMemory alias: **1421D0B2F** [Edit](#)
 - Device status: **Attached**
 - Swap support: **Disabled**
 - Beacon: **Off** [Enable](#)
- Firmware**
 - VSL driver version: **3.2.6**
 - Firmware version: **7.1.13 (109322)**
- Low-Level Formatting**
 - Low-level formatting: **Factory capacity**
 - Total factory capacity: **3,000 GB (2,793.968 GiB)**
100% factory capacity
 - Format capacity: **3,000,000,000,000 bytes**
 - Sector size: **512 bytes**



The shaded area at the left of the screen identifies the drives in your ION Accelerator appliance, by ioMemory device serial number. In the example above, bracketed pairs represent drives on the same controller.

Information for the selected ioMemory module is shown in the main area of the screen:

- *Settings* – For selected hosts, this area shows the ioMemory alias, device status (attached or detached), swap support (enabled or disabled), and beacon status (on or off).

To rename the alias for a selected host, click **Edit** and type the new name.

To enable the beacon for a drive, click **Enable**. For more information on the beacon feature, refer to the *ioDrive User Guide*.

- *Firmware* – For selected hosts, this area shows the current VSL and firmware version.
- *Low-Level Formatting* – For selected hosts, this area shows the low-level formatting method (Factory Capacity, x, or y); total factory capacity in GB or GiB; format capacity in bytes; and formatted sector size in bytes.



For details on the Live and Reports tabs, see [Monitoring ION Accelerator Performance](#) later in this guide.

Using the Info Tab

The Info access tab in the Configuration screen supplies a variety of data about a selected ioMemory module within a host.

1. Select the host whose information you want to view.
2. Click the Info access tab. A screen similar to the one below appears. Any alerts that were generated appear under the Alerts heading (see [Handling ION Accelerator Alerts](#)).



▼ General Information

Serial Number: **1421D0AC2**
Device Path: **/dev/fct1**
Model: **3000GB ioDrive2**
Block Device Path: **/dev/fiob**

▼ Usage

Active Media: **100.00 %**
Reserve Space: **100.00 %**
PBW Endurance Rating: **37 PB**
PBW Used: **0.032 PB**
MiB Written: **30,873,579.548 MiB**
MiB Read: **15,977,625.931 MiB**

▼ PCI Information

PCI Address: **05:00.0**
PCI Slot Number: **6**
PCI Vendor ID: **0x1AED**
PCI Subsys Vendor ID: **0x1028**
PCI Device ID: **0x2001**
PCI Subsys Device ID: **0x1F7D**
PCIe Bandwidth MB/s: **2000**
PCIe Link Speed: **5.0 Gbits/sec/lane**
PCIe Link Width: **4 lanes**
PCIe Slot Power: **25**

▼ Adapter Information

Adapter Board Kind: **Single Ctrlr**
External Power: **Not Connected**
Adapter S/N: **1421D0AC2**
Adapter PCI Slot Power: **25 W**
Location Within Adapter: **0 Center (0)**
PCIe Bus voltage: **Avg 11.894 V**
Adapter PCIe Link Width: **4 lanes**
PCIe Bus current: **Avg 0.873 A**
Adapter PCIe Link Speed: **5.0 Gbits/sec/lane**
PCIe Bus power: **Avg 10.416 W**
Adapter PCIe Bandwidth: **2,000 MB/s**
PCIe Power Limit: **55 W**



COLUMNS AND SEARCH (IOMEMORY)

The default columns for the ioMemory screen are shown to the right. To change the columns that are displayed, click the Columns link and clear or check the boxes as desired. Then click **Update Columns** to save the changes.



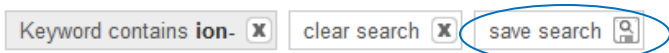
You can also use the basic Search feature and the Enhanced Search tab to find attributes in your ION Accelerator appliance that correspond to the column entries. See [Basic Search](#) and [Enhanced Search](#) earlier in this guide.

SAVED SEARCHES

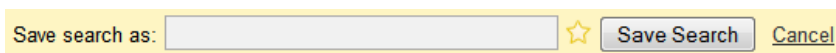
You can save a search that uses ioMemory parameters. That way you can run the search later without having to set up the parameters.

To create a saved search,

1. Do a basic or enhanced search.
2. When the search is complete, click the "save search" button that appears.



3. In the dialog that appears, type a name for the search and click **Save Search**.



A success message appears:



4. To retrieve the saved search, click the Saved Searches link in the Settings tab. See [Saved Searches](#) in *Configuring ION Accelerator Settings* later in this guide for more details.

EDIT COLUMNS

- Status
- Hostname
- Storage Pool
- Active Media
- Alias
- Beacon Status
- Board Kind
- Current Operation
- Current Operation Phase
- Current Operation Progress
- Device Label
- Device Name
- Driver Version
- ECC Bytes Per Codeword
- ECC Num Bits Correctable
- Factory Capacity
- Format UUID
- Current Firmware Revision
- Current Firmware Version
- Minimum Firmware Revision
- State
- Host Online
- Location Within Adapter
- PCI Device ID
- PCI Slot Number
- PCI Subsys Device ID
- PCI Subsys Vendor ID
- PCI Vendor ID
- PCIe Bandwidth
- PCIe Link Width
- PCIe Link Speed
- PCI Slot Power
- Port Within Adapter
- Swap Support
- Current RAM Used
- Peak RAM Used
- Reserve Space
- Sector Count
- Sector Size
- ioMemory S/N
- Session Read Ops
- Session Write Ops
- Formatted Size
- FPGA Temperature
- Total Physical Read
- Total Physical Written
- Agent Version
- Trim Service Active
- Host IP
- Host Online
- Host OS
- OS Native Trim Active
- Host Offline Since
- Trim Enabled
- Adapter Board Kind
- Power Amps
- Min Volts
- Peak Amps
- Peak Volts
- Peak Watts
- Power Volts
- Power Watts
- External Power
- Adapter PCIe Bandwidth
- Adapter PCIe Link Width
- Adapter PCIe Link Speed
- Adapter PCI Slot Power
- PCIe Power Limit
- Power Monitoring
- Adapter S/N
- Product Name
- Product Serial Number
- Product SKU
- Part Number
- Alt Part Number
- Filesystems
- Cluster Name
- Cluster IP Address



Getting Host Information

To get information about ION Accelerator hosts (target system nodes), click the **Hosts** link in the Configuration screen. A sample Hosts screen is shown below.

C1 HOSTS						Enhanced Search ▾
Hostname	Host IP	Host OS	Status	Drives	Cluster Name	Edit Columns
t1	10.50.11.109	Linux 3.0.42-0.7-default	✔ Online	1150D0159-1111,1150D0159-1121,11	c1	
t2	10.50.11.133	Linux 3.0.42-0.7-default	✔ Online	1150D0045-1111,1150D0045-1121,11	c1	

Page 1 of 1 | [Refresh](#) | Displaying 1 - 2 of 2

The following columns are displayed:

- Hostname – Name of the ION Accelerator node, as set in First Boot. Clicking this link displays the ioMemory Configuration page (see the [ioMemory Configuration](#) section for details).
- Host IP – IP address of the ION Accelerator node
- Host OS – Operating system on the ION Accelerator node
- Agent Status – Connectivity status of the ION Accelerator agent: Online, error, or <alert>. If an error or alert condition is shown, clicking its link displays the Alerts page for details.
- Drives – List of serial numbers for the ioDrives installed in the ION Accelerator node
- Cluster Name – Name of the cluster that this ION Accelerator node is part of. Clicking this link displays the ION Accelerator Clusters screen.



HOST CONFIGURATION DETAILS

To get more information about a host, click its Hostname link to display a Host Configuration screen.

The screenshot shows a web interface for host configuration. On the left, there is a list of hosts: **ionr9i54**, 1421D09FD, 1421D0AC1, 1421D0AC4, and 1421D0B2F. The **ionr9i54** host is selected. On the right, there are two tabs: **CONFIGURE** and **LIVE**. Below the tabs, there are three links: [Monitor Chassis](#), [Shut Down Host](#), and [Collect System Logs](#). A dropdown menu is open under the **CONFIGURE** tab, showing a **Basic** section with the following details:

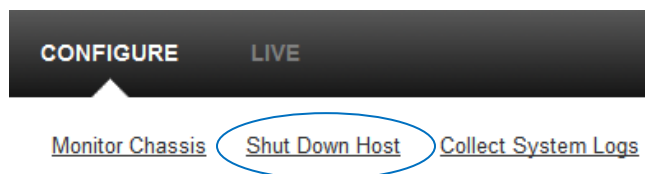
Host Name:	ionr9i54
Agent Status:	✓ Online
IP Address:	10.60.34.54
OS:	Linux 3.0.101-0.15.1.6651.0.PTF-default

The following fields are available:

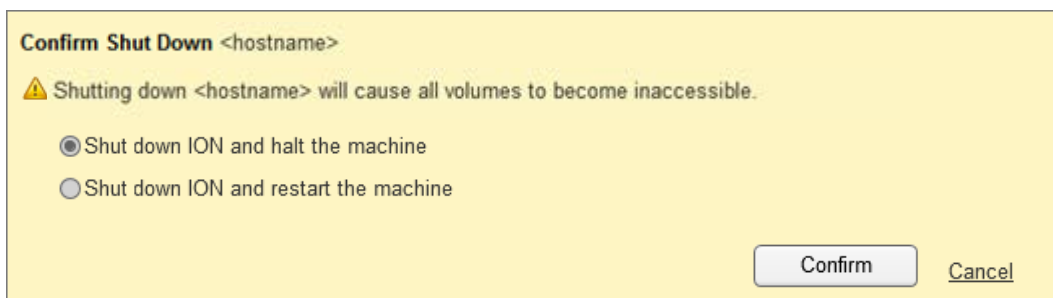
- ioMemory Modules (left pane) – See the [ioMemory Configuration](#) section for details.
- [Monitor Chassis](#) – This link connects to a chassis monitoring URL for the type of ION Accelerator appliance you are using.
- [Shut Down Host](#) – This link enables you to shut down the selected host. Verify the server name (upper left corner of the window) to make sure you are shutting down the intended host. (See *Shutting Down a Host* below.)
- [Collect System Logs](#) – This link enables you to download logs from the ION Accelerator host for assistance in troubleshooting (see [Collecting System Logs](#) below).
- Basic area – Displays the host name, agent status, IP address, and host OS version

Shutting Down a Host

1. Click the **Shut Down Host** link.

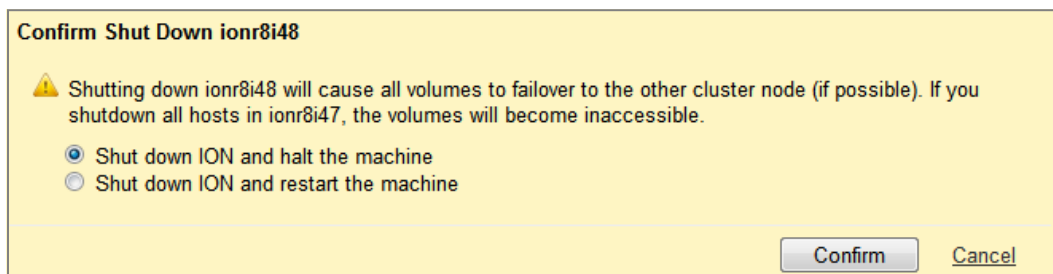


If the host you are shutting down is a standalone server, the following dialog appears:



1. Make sure you have read the warning statement in the dialog.
2. Select the type of shutdown you want: shut down and halt, or shut down and restart.
3. Click **Confirm**.

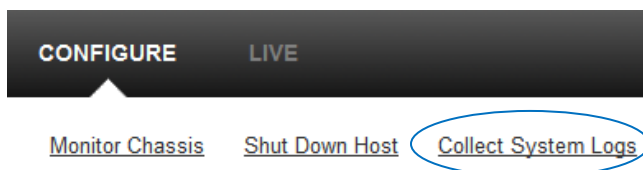
If the host is part of a cluster, a dialog similar to the following one appears:



1. Make sure you have read the warning statement in the dialog.
2. Select the type of shutdown you want: shut down and halt, or shut down and restart.
3. Click **Confirm**.

Collecting System Logs

1. Click the Collect System Logs link.



If no USB drive is detected in the ION Accelerator appliance, the download begins immediately. If a USB drive is detected, a dialog appears so you can specify where to save the system log. Ensure there is enough free space on the USB drive for the logs, and then click **Download**.



COLLECT SYSTEM LOGS X CLOSE

Save to local machine

Save to USB drive in appliance

Download Cancel

Log information is captured to help Customer Support determine the cause of the problem. The log is generated as a .tar.bz2 file, with a filename that indicates the date and time of the capture. For example, `fio-systemlog_20140218T105539.tar.bz2` indicates a date of 02/18/2014, at 10:55:39.

2. Click **Open** or **Save** in the browser dialog that appears.
3. After you collect the log file, e-mail it to support@fusionio.com for troubleshooting help.

COLUMNS AND SEARCH (HOSTS)

The default columns for the Hosts screen are shown below. To change the columns that are displayed, click the Columns link and clear or check the boxes as desired. Then click **Update Columns** to save the changes.

EDIT COLUMNS

Agent Version

Trim Service Active

Host IP

Host Online

Host OS

OS Native Trim Active

Host Offline Since

Trim Enabled

Agent Status

Drives

Cluster Name

Cluster IP Address

The following non-default columns may also be selected:

- Agent Version – Version of the `fio-agent` running on the ION Accelerator host
- Trim Service Active – Active or Inactive
- Host Online – Online or Disconnected
- OS Native Trim Active – Active or Inactive



- Host Offline Since – Beginning point at which the host went offline, in YYYY:MM:DD format
- Trim Enabled – Whether the native Trim service is enabled
- Cluster IP Address – Cluster IP address for this host

You can also use the basic Search feature and the Enhanced Search tab to find attributes in your ION Accelerator appliance that correspond to the column entries. See [Basic Search](#) and [Enhanced Search](#) earlier in this guide.



Managing Clusters In HA Configurations



For effective HA configuration, it is highly recommended that your storage pool profile be set to "Maximum Performance". See [Storage Profile Types](#) in the *Setting up Storage* section for details.

If you have set up clusters, you can manage them in the GUI. To do so, click the **Clusters** link from the **Configuration** tab. The Clusters window appears, like the one shown below.

CLUSTERS			Enhanced Search ▾
Cluster Name	Status	Cluster IP Address	Columns
c45	✓ Online	10.60.31.46	

Page 1 of 1 | Displaying 1 - 1 of 1

The following columns are displayed:

- Cluster Name – Name of the cluster. Clicking the link displays information about the cluster and actions you can perform. For details, see the [Getting Host Information](#) section earlier in this guide.
- Status – Status of the cluster: Online or Offline.
- Cluster IP Address – IP address for the cluster, as configured in the First Boot process.



COLUMNS AND SEARCH (HA)

The default columns for the HA version of the ioMemory screen are shown below. To change the columns that are displayed, click the Columns link and clear or check the boxes as desired. Then click **Update Columns** to save the changes.

ADD / REMOVE COLUMNS

Status

Cluster IP Address

You can also use the basic Search feature and the Enhanced Search tab to find attributes in your ION Accelerator appliance that correspond to the column entries. See [Basic Search](#) and [Enhanced Search](#) earlier in this guide.



Monitoring ION Accelerator Performance

ION Accelerator provides powerful, easy-to-use performance monitoring tools to help you analyze the effectiveness of your system. The main performance tools are

- Performance Graphs (Overview Tab)
- Live Meter View
- Reports



You can also use the Status column of the ioMemory screen to display real-time analysis of individual ioDrive performance. See [Managing ioMemory](#) for details.

PERFORMANCE GRAPHS (OVERVIEW TAB)

The Overview tab provides a quick look at the bandwidth or IOPS performance for any host or ioMemory device in the ION Accelerator appliance, depending on your settings. It also displays activity for connected network devices.

To view the performance for currently running I/O on your system, click the **Overview** tab (and scroll to the bottom of the screen if necessary).



Your browser must support Adobe Flash so the performance graphs display correctly.

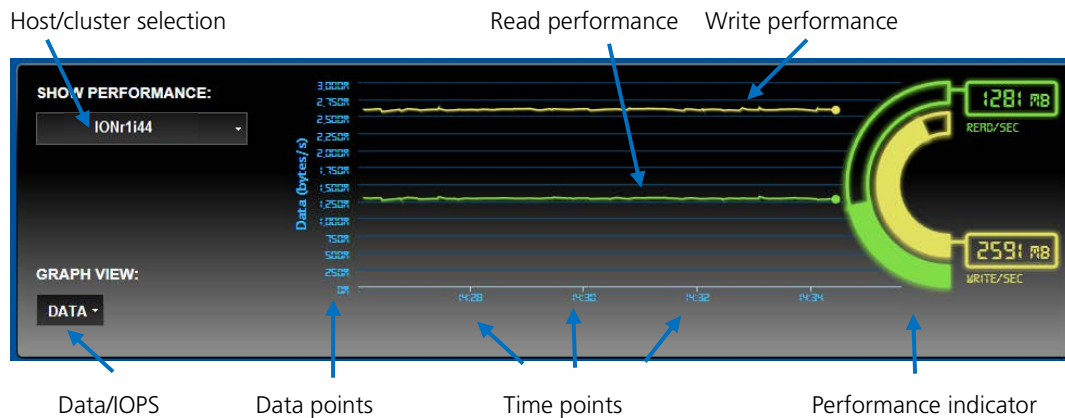
Your connected initiator contacts the ION Accelerator host to update the performance graph.

Buffering... Please wait.

A few moments after connecting, a performance summary graph appears, similar to the one shown below (bandwidth, in this example).

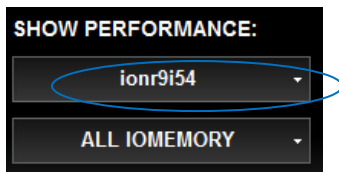


If you leave the Overview screen, the live connection is broken. Returning to the screen re-establishes the connection; previous performance data is not available as new data appears. Historical data is available, however, in ION Accelerator reports. See [Reports](#) for details.



Here are the basic elements of the graph:

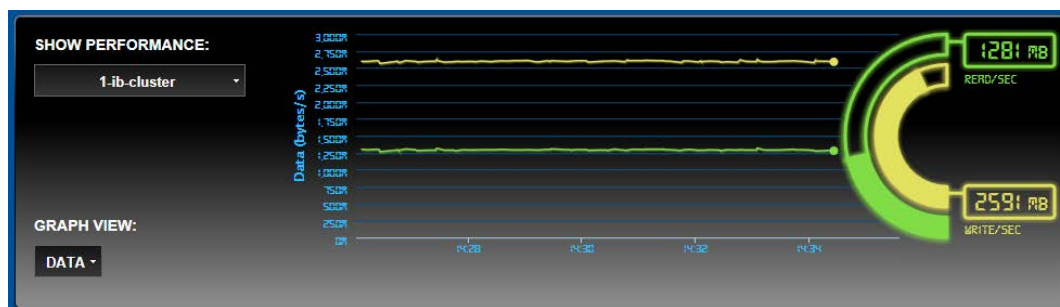
- Host/cluster selection – Click the box to select the cluster (default, if available) or host you want to monitor. For example:



- ioMemory selection – Click the box to select the ioMemory module you want to monitor, or ALL IOMEMORY; or ALL CNA; or a selected network adapter. If you choose ALL IOMEMORY, performance for all ioMemory is aggregated in the graph.

ALL IOMEMORY
SLOT 4 (1421D0B2F)
SLOT 5 (1421D09FD)
SLOT 6 (1421D0AC4)
SLOT 7 (1421D0AC1)
ALL CNA
SLOT 0 - Broadcom
SLOT 1 - Mellanox Technologies
SLOT 2 - Mellanox Technologies
SLOT 3 - Mellanox Technologies

- Data/IOPS – Click the Data box to toggle between a Data view (bandwidth) and Operations view (IOPS). A sample IOPS performance screen is shown below.
- Performance lines – The colored lines show bandwidth in MB/s (if the Data box is selected) or IOPS (if the Operations box is selected). Green = read performance; yellow = write performance.
- Data points – The blue numbers at the left of the graph show fractions of the peak performance numbers. The viewable chart of data points rescaled when performance values change significantly.
- Time points – As the graph area slowly scrolls to the left in real time, new time points (HH:MM) appear at the bottom right of the each minute, and eventually disappear to the left. The time range for viewable performance data is 5 minutes.
- Performance indicator – The yellow and green semi-circle icons at the right of the box show bandwidth or IOPS numbers. A fully colored circle-slice indicates that the selected ioMemory modules are performing at or near the most recent peak. Semi-circles are rescaled with changes in performance peaks.



ION Accelerator Performance – Operations (IOPS)



When you switch between ioMemory modules or network adapters, the software will pause to regenerate the performance data.

Interpreting Performance Figures

The performance figures viewed in ION Accelerator based directly on the number of reads and writes made to individual ioMemory devices, not on reads and writes being made to a storage pool or volume. When reading live performance data, it is important to remember that writes can be duplicated many times across different drives in a RAIDset, and reads can be divided among multiple devices in the same RAIDset. Additionally, writes are duplicated across nodes in an HA configuration, so it is important to take into account your current ION Accelerator configuration.

For example, suppose you have an HA cluster with one volume on a RAID 1 storage pool. Every write to the volume will be duplicated first between each node in the cluster, and then to each drive in the RAID. The result would be a total of 4x the number of writes across the whole appliance, compared to the number made in a standalone system in Direct Access mode.

LIVE VIEW

The Live View is a powerful tool for seeing real-time performance statistics within your ION Accelerator appliance. The following performance metrics are available:

- Read and write bandwidth, in MB/s
- Read and write IOPS
- Average bandwidth and IOPS statistics over time
- Temperature, in degrees Celsius
- Current RAM usage
- Peak RAM usage
- Petabytes written (PBW) endurance
- Reserve space available



To access Live View,

1. Click the **Configuration** tab.
2. Click **ioMemory** at the left of the screen.
3. In the ioMemory screen, click the name of the ioMemory module you want to monitor.
4. Click the **Live** access tab. The Live Meter View screen appears, with the ioMemory module selected.



The performance graph works the same way as the one displayed in the Overview tab, with the added feature of Average bandwidth and IOPS performance over time (shown directly below the Data and Operations boxes).



Navigating away from the **Live** tab resets the statistics for the next time the tab is opened.

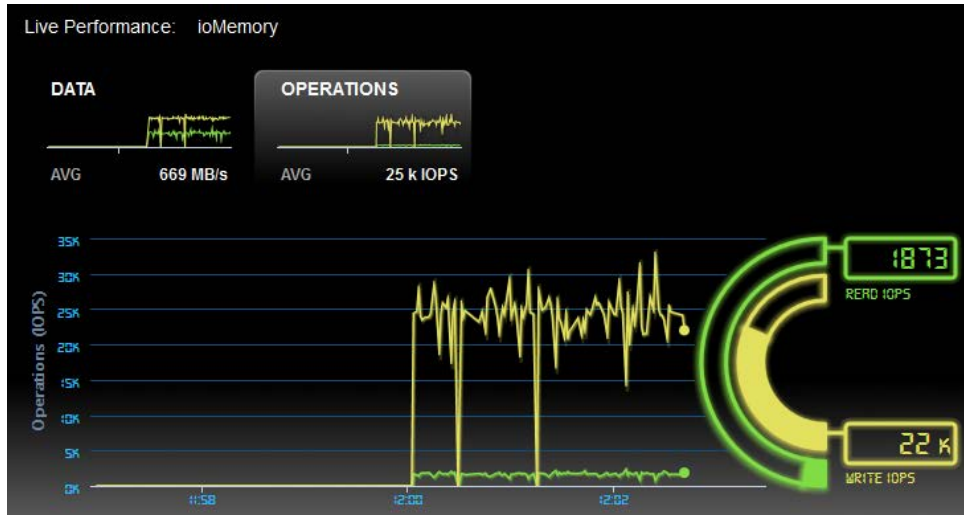
In addition, the Live View offers several other performance metrics:

- Temperature – Indicates the current operating temperature of the selected ioMemory device, in degrees Celsius. The right-hand edge of the scale shows the warning and failure points for high temperatures in the device.
- Current RAM – Shows the maximum amount of RAM allocated to the ION Accelerator software in this server (host).
- Peak RAM – Shows the highest amount of RAM this ioMemory module has actually used.
- PBW Endurance – Shows the projected lifetime endurance for the ioMemory device. 100% means virtually no reading or writing has occurred. As the NAND flash wears, the endurance percentage drops until eventually it reaches a warning or failure point at the left of the scale.



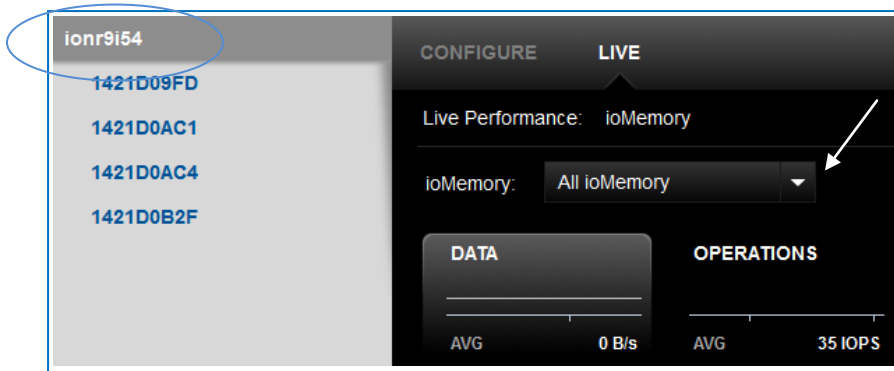
- Reserve Space – Indicates how much reserve space is available on the ioMemory device. 100% means the maximum reserve allocated at format time is available; 0% means no reserve space is available.

To switch to IOPS monitoring, click the Operations box. An Operations (IOPS) view is shown below:

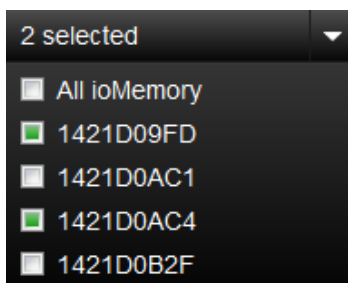


Viewing Performance for Multiple Devices

You can view aggregated performance statistics for ION Accelerator by selecting a host at the left of the window (circled below).



An ioMemory selection drop-down appears in the main window. When you click it, you can a) select “All ioMemory” for the host (default); or b) clear the “All ioMemory” checkbox and select just the modules you want to monitor. In the example below, two of the ioMemory devices are selected (green).



The following performance statistics are *aggregated* for all selected ioMemory modules:

- Live data
- Live operations
- Current RAM
- Peak RAM

Performance statistics for PBW Endurance and Reserve Space are *averaged* for all selected ioMemory modules:

Temperature corresponds to the *highest* value found for any ioDrive device.



When multiple devices are selected, the Reports and Info tabs are not available.

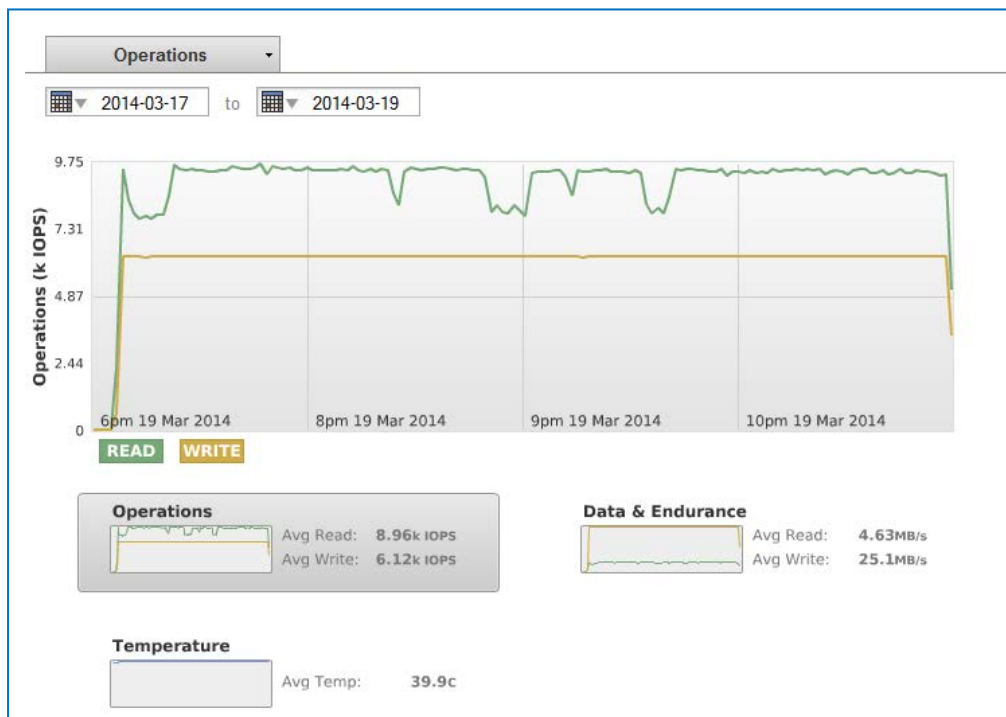
REPORTS

To view historical reports for ION Accelerator performance on a *single* ioMemory module,

1. Navigate to the ioMemory Configuration screen (Configuration > ioMemory > (selected ioMemory module)).
2. Click the **Reports** access tab. (If the Reports tab is not accessible, make sure you have selected only *one* host in the left side of the screen.)

Operations Report

By default, an operations performance report is displayed. The report date range starts with the date the ION Accelerator software was installed, until the current date; these dates can be changed, as explained below. The vertical timelines appear every 4 hours, for reference.

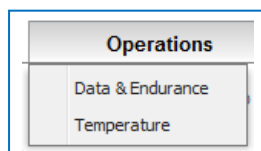


The following performance metrics are captured:

- Results graph – Shows the statistics (IOPS, bandwidth, data/endurance, or temperature) for the date range
- Operations summary – Shows the average read and write IOPS (or bandwidth). Click the summary rectangle to display the IOPS or bandwidth details in the Results graph.
- Data and endurance summary – Shows the average data rate for reads and writes across the date range. Click the summary rectangle to display the data and endurance details in the Results graph.
- Temperature – Shows the average temperature in degrees Celsius for the date range. Click the summary rectangle to display the temperature details in the Results graph.

Changing Report Parameters

To change the type of information to be graphed in the report, click the tab (**Operations** by default) and select the type of data you want to monitor.



To change the date range for the report, click and use the two provided calendars to select the From and To dates for the report.

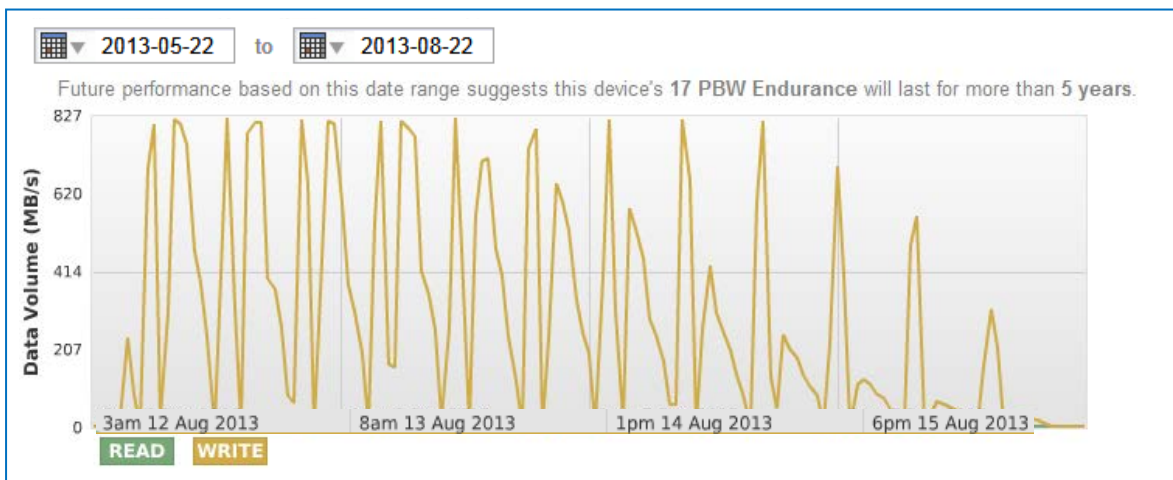


2013-10-30 to 2014-01-30

The software generates a performance report for the date range you selected. To exit the Reports access tab, click the **Configuration** tab.

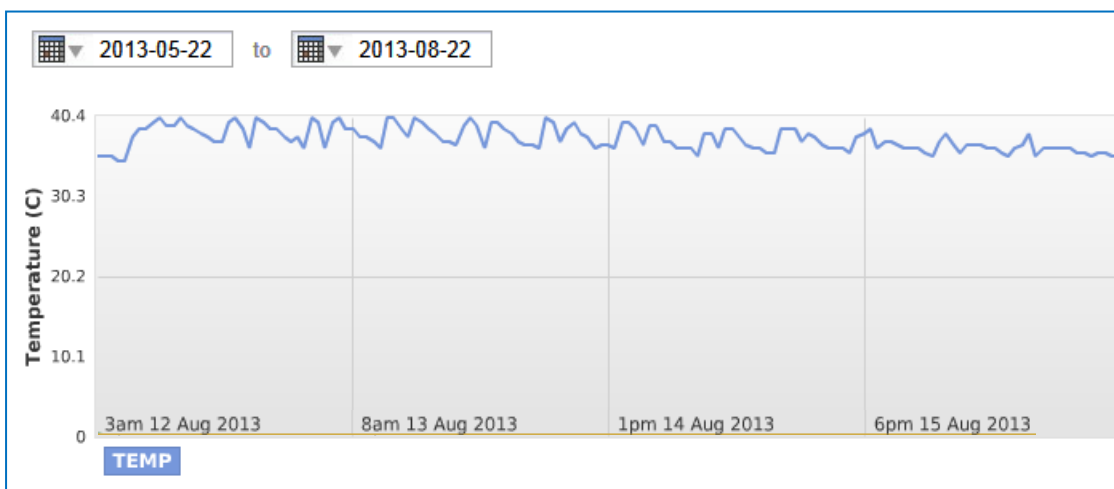
Data and Endurance Report

A sample Data and Endurance report is shown below. It displays the data volume (MB/sec, read and write) over the report date range. An estimate is given of the device's write-endurance lifespan, based on the current data volume rate.



Temperature Report

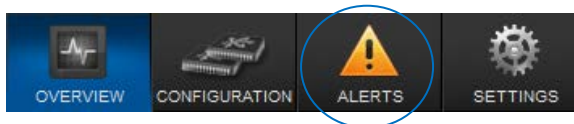
A sample Temperature report is shown below, displaying the device temperature in degrees Centigrade over the report date range.





Handling ION Accelerator Alerts

ION Accelerator generates alerts in the GUI to notify you of potential performance issues. If there are active alerts, the Alerts icon in the Task Bar (circled below) pulsates to notify you, until you click it:



To display alerts (informational, warning, or error conditions) that have been received on any of the configured volumes, click the **Alerts** tab. (A summary of alerts is also available in the ioMemory Configuration screen.)

HOSTS Enhanced Search ▾

All | Warnings | Errors | Info | Show Only Active Alerts All dates ▾ [Edit Columns](#)

Type	Summary	Item	Hostname	Time Reported (UTC...)	
	Volume is not in sync with its peer.	Pool volume	IONr1i44	2012-11-05 18:41	Archive
	Volume is re-synchronizing with its p...	Pool volume	IONr1i44	2012-11-05 18:58	
	Volume is not in sync with its peer.	Pool volume	IONr1i44	2012-11-05 19:13	
	Volume is re-synchronizing with its p...	Pool volume	IONr1i44	2012-11-05 20:02	
	Volume is re-synchronizing with its p...	Pool volume	IONr1i44	2012-11-05 20:05	
	Volume is re-synchronizing with its p...	Pool volume	IONr1i44	2012-11-05 20:36	
	Volume is re-synchronizing with its p...	Pool volume	IONr1i44	2012-11-05 20:41	
	Volume is re-synchronizing with its p...	Pool volume	IONr1i44	2012-11-05 20:43	
	Volume is re-synchronizing with its p...	Pool volume	IONr1i44	2012-11-05 20:54	
	Volume is re-synchronizing with its p...	Pool volume	IONr1i44	2012-11-05 21:02	

Page 1 of 2 Displaying 1 - 10 of 17



The following *columns* are available in the Results table:



- Type – Type of alert: Informational, Warning, or Error
- Summary – Description of the problem that caused the alert
- Item – Detailed information on the alert item
- Hostname – Name of the host server where the alerts occurred
- Time Reported – UTC time when the alert was generated
- Storage Pool – Name of the storage pool where the alert was generated

The following *actions* are available in the row above the Results table:

- Warnings – Click to show only warning alerts.
- Errors – Click to show only error alerts.
- Info – Click to show only informational alerts.
- Show only active alerts – Select this box to show only alerts that are still active, not those that have been resolved.
- Dates – In the Dates drop-down menu, select one of these options to filter alerts by date:
 - “All dates” (since ION Accelerator was installed on this system)
 - “For the last 365 days”
 - “For the last 128 days”
 - “For the last 10 days”

Additional actions include:

- Displaying alert descriptions – Click the “plus” icon next to an alert summary. For example:

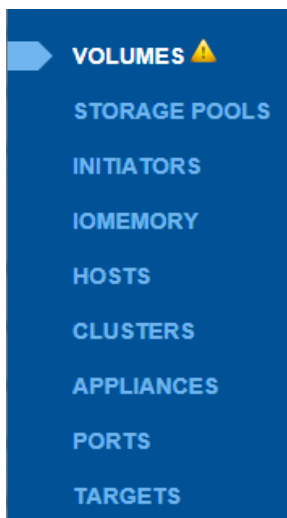
  Configuration Error. [ion-r6-dl380-n1 \(Host\)](#)

Description:
An error occurred while performing a configuration operation.
Attempted to: Create a host log.
Result: 90001 (Operation not started - host was offline.).

- Item – Click the Item link to view the configuration for the ioMemory module that produced the alert.
- Hostname – Click a hostname for details about the host (see [Getting Host Information](#)).
- Archive – Click the **Archive** link (rightmost column) to archive the alert.



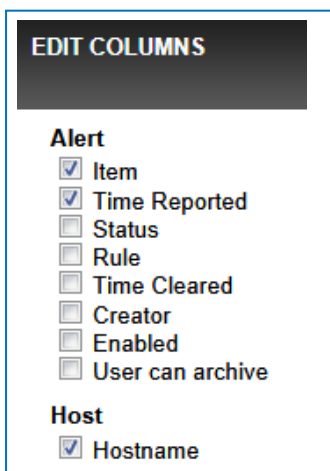
Also, when there are one or more active alerts in a category, an icon representing the most serious type of alert (error, warning, or informational) appears next to that category in the left pane. For example:



You can then click a category marked by an icon to display the alerts.

COLUMNS AND SEARCH (ALERTS)

The default customizable columns for the Volume screen are shown below. To change the columns that are displayed, click the Columns link and clear or check the boxes as desired. Then click **Update Columns** to save the changes.



The following non-default columns may be selected:

- Status – Cleared or Set
- Rule – ID number for the corresponding rule
- Time Cleared – Time (UTC-7) when the alert was cleared



- Creator – Fusion-io (system-generated alerts) or the username who created the alert rule
- Enabled – True if the alert rule is enabled; False otherwise.
- User can archive – True or False. This will be True for active alerts that originated from a user rule or a failed command, and false for all other cases. See *Archiving Alerts* below for more details.

You can also use the basic **Search** feature and the **Enhanced Search** tab to find attributes in your ION Accelerator appliance that correspond to the column entries. See [Basic Search](#) and [Enhanced Search](#) earlier in this guide.

ARCHIVING ALERTS

Active alerts that originated from a user rule or a failed command are not automatically cleared when the alert condition is resolved. To remove these from the list of active alerts, you can archive them; that way, they appear only when you show all alerts.

To archive an alert,

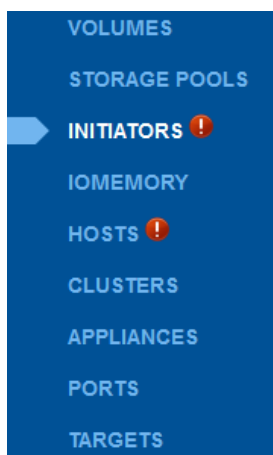
1. Make sure the “User can archive” column shows True for the alert.
2. In the far right column for the alert, click **Archive**. (This column has no heading name.)



Not all alerts can be archived.

ALERTS BY CATEGORY

If you need to limit the display of alerts to a certain category, you can click any of the links at the left of the Alerts screen:



The example above shows that one or more error alerts exist for Initiators and Hosts.



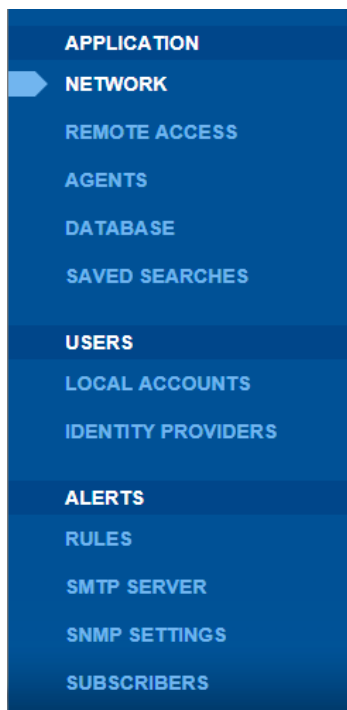
These links display only *alert* information; they should not be confused with the Configuration screens for the categories.



Configuring ION Accelerator Settings

The **Settings** tab enables you to configure a wide variety of settings for your ION Accelerator software. Click the left-hand link for the type of setting you want to configure.

The groups are Application, Users, and Alerts, each with several link choices:





APPLICATION

The Application menu features links that help users manage access to the ION Accelerator software.

Network

The Network settings screen below shows a variety of network information for each port in the ION Accelerator host. (Edit buttons are visible only to administrators.)

NETWORK								
ION Cluster Name	ion-r6-dl380-ha							
Timezone	PDT							
NTP Server	1.opensuse.pool.ntp.org							
Gateway	10.60.33.1							
DNS	10.60.10.20							
Cluster Node	Port	Status	IP Address	Port address	Subnet Mask	Mode	MTU	Link Speed
ion-r6-dl380-n0	4	Up	192.168.1.1	00:02:c9:fc:31:c0	255.255.255.0	Cluster	9000	40 Gb/s
ion-r6-dl380-n0	5	Up	192.168.2.1	00:02:c9:fc:31:c1	255.255.255.0	Cluster	9000	40 Gb/s
ion-r6-dl380-n0	0	Up	10.60.33.109 EDIT	00:1b:21:3a:a5:90	255.255.255.0 EDIT	Management EDIT	1500	1 Gb/s
ion-r6-dl380-n0	1	Down	Unavailable EDIT	00:1b:21:3a:a5:91	Unavailable EDIT	Management EDIT	1500	Unavailable
ion-r6-dl380-n0	2	Down	Unavailable EDIT	00:1b:21:3a:a5:94	Unavailable EDIT	Management EDIT	1500	Unavailable
ion-r6-dl380-n0	3	Down	Unavailable EDIT	00:1b:21:3a:a5:95	Unavailable EDIT	Management EDIT	1500	Unavailable
ion-r6-dl380-n1	4	Up	192.168.1.2	00:02:c9:fc:32:00	255.255.255.0	Cluster	9000	40 Gb/s
ion-r6-dl380-n1	5	Up	192.168.2.2	00:02:c9:fc:32:01	255.255.255.0	Cluster	9000	40 Gb/s
ion-r6-dl380-n1	0	Up	10.60.33.115 EDIT	00:1b:21:3a:a4:a0	255.255.255.0 EDIT	Management EDIT	1500	1 Gb/s
ion-r6-dl380-n1	1	Down	Unavailable EDIT	00:1b:21:3a:a4:a1	Unavailable EDIT	Management EDIT	1500	Unavailable

Page 1 of 2 Displaying 1 - 10 of 12

At the top of the screen, information is displayed for the ION Cluster Name (or ION Host Name, depending on your configuration), the time zone, the NTP Server address, Gateway address, and DNS. The columns in the screen display the following information:

- Cluster Node (HA systems only) – Identifies the node of the cluster
- Port – Number of the Ethernet port for this host
- Status – Connection status for the port: Up, Down, or Unavailable
- IP Address – IP address for the node port. Click **Edit** to change the address.



If a port is in Cluster mode, the IP address, subnet mask, and mode are not editable.



- Port Address – MAC address of the node port
- Subnet Mask – Click **Edit** to change the subnet mask address.
- Mode – Management, iSCSI, or Cluster. Click **Edit** to switch between Management and Cluster modes.
- MTU – Maximum Transmission Unit size: 1,500 or 9,000 bytes
- Link Speed – Data transmission speed for the network link, in Gb per second

Remote Access

You can configure users' and hosts' remote access settings here.

REMOTE ACCESS

To allow remote connections, you must enable and configure the remote access settings.

Agent Push Frequency seconds

Server Address (URL)

Host Name ⓘ ▼

Port

SSL Certificate Options

Choose the certificate type that should be used for the SSL connection.

Pre-configured SSL certificate (Less secure)
This certificate type prevents the agent from validating that this server's hostname matches the certificate, and will cause web browsers to warn of an untrusted certificate.

Custom SSL certificate (More secure)

- *Agent Push Frequency* (optional) – Indicates the number of seconds between “pushes” (uploads) of data from ioMemory modules to the ION Accelerator host, with the default at 15 seconds. Increasing this number makes updates less frequent (and history/report information less detailed). Decreasing this number makes updates more frequent, but this could affect performance if you are using many clients (more than 20 or 30, for example).
- *Host Name* – In the dropdown list, enter or select an IP address that will not change in an uncontrolled way (such as a DHCP lease that expires). This address is used by Agent services to communicate to the ION Accelerator Server. For tips on selecting a host name, click the blue icon next to “Host Name”. See [Setting the Hostname and Routing Information](#) earlier in this guide for information on host name requirements.



- *Port* – By default, the port is set to 443; you can change the port depending on your requirements
- *Pre-configured SSL Certificate (less secure)* – A pre-configured certificate is provided but will result in "untrusted certificate" messages. It is less secure than using a certificate made specifically for your server that is signed by a trusted CA.
- *Custom SSL Certificate (more secure)* – Select this option to update your own Key, Certificate, and optional CA Chain. With this option selected, Save Changes is disabled until the Key and Certificate values are specified.

Agents

ION Accelerator automatically grants access to agents, so further configuration with the Agents feature is not necessary.

Database

Click the **Database** link at the left of the Settings screen to display the History Database dialog.

HISTORY DATABASE

Manage various aspects of the database.

History Database Size

Current Database Size	9.8MB
Keep Historical Data	<input type="text" value="360"/> days

Estimated database size: 38.9MB

The History Database captures the raw performance data that is used in ION Accelerator reports, such as bandwidth, IOPS, temperature, endurance, etc.

To adjust the size of your history database,

1. In the Keep Historical Data field, specify how many days to include in the historical data.
By default, the last 30 days of data are kept; the maximum is two years (730 days). The estimated database size is calculated as you change the number of days' worth of data.
2. Click **Save Changes**.

Saved Searches

The Saved Searches link enables you to retrieve searches that have been saved by any user of the ION Accelerator appliance. Below is a sample screen with a saved search.



MY SAVED SEARCHES

★ Hostname contains "ion" [View search results](#) [Delete](#)

Note: Removing a saved search will not remove the devices assigned to that search.

OTHER USERS' SAVED SEARCHES

No Saved Searches have been created.

You can click the "View search results" link to see the results in the ioMemory screen.

To delete a saved search (but not its devices),

1. Click the **Delete** link. A Delete confirmation message appears:

Delete saved search **Hostname contains "ion"?**

2. Click **Confirm** to complete the deletion. A success message appears:

✔ Saved Search has been successfully deleted

To delete another user's search you must be logged in as an Admin role.

USERS

The **Users** links help you create and manage user accounts and user roles.

Local Accounts

Click the **Local Accounts** link to display the Local Accounts dialog.

LOCAL ACCOUNTS

[Columns](#)

<input type="checkbox"/>	Username	Role ▲	Status	
<input type="checkbox"/>	admin	1-Admin	✔ Enabled	
<input type="checkbox"/>	username	2-Monitor	✔ Enabled	Delete

To *add* a user,

1. Click the **Add User** link. The Add User dialog appears.



ADD USER X CLOSE

User

Username:

Password:

Confirm Password:

Permissions

Enabled Enable this user account.

Role: Admin ▾

Add User Cancel

2. Enter a unique username and password, and then confirm the password.
3. If you want to disable this user's account, clear the "Enable this user account" box (checked by default).
4. In the Role list, select the role for the user: Admin (allowed to see and perform all operations) or Monitor (view-only access; cannot perform configuration operations).
5. Click **Save**.

To *edit* a username, click the **Username** link and type the new name.

To *delete* a user, click the corresponding **Delete** link.

Bulk Actions

Using the checkboxes next to each user, you can select an action to apply to all the selected users. The bulk actions are Enable, Disable, and Delete; the Roles are Admin and Monitor. Rights for the selected role are automatically applied to each selected user.

Bulk Actions... ▾ Apply

Change Role to... ▾ Apply

Enable

Disable

Delete

Admin

Monitor

Changing Passwords

To change a user's password, click a username in the screen. To change your password while you are logged in, click your user name in the upper right corner of the screen. Either action displays the **Edit User** dialog.



EDIT USER X CLOSE

User

Username: admin

New Password: [Change Password](#)

Save Changes Cancel

1. Click **Change Password**.

EDIT USER X CLOSE

User

Username: admin

Old Password:

New Password:

Confirm New Password:

Save Changes Cancel

2. Type the old password and new password, and then confirm the new password.
3. Click **Save Changes**.



If you change another user's password, you do not need to enter the old password, and you must be an ION Accelerator Admin. However, when you change the admin's account password, you must enter the old password.

If you forget your admin password, you can reset it by running `setup password` at the command line. For details, see the *ION Accelerator Appliance CLI Reference Guide*.

Columns

The default columns for the Local Accounts screen are Role, Status, and Delete. To change the columns that are displayed, click the Columns link and clear or check the boxes as desired. Then click **Update Columns** to save the changes.



Identity Providers (LDAP)

Currently, ION Accelerator supports internal identities and LDAP identity providers:

IDENTITY PROVIDERS + Add LDAP				
Provider	Type	Info	Status ▲	Delete
Internal Identities	Local		● Enabled	

To add or change internal identities for ION Accelerator, click the **Internal Identities** link. The **Local Accounts** screen appears, where you can add or change internal accounts. See [Local Accounts](#) earlier in this guide for details.

LDAP

- To add an LDAP provider, click the Add LDAP link. The Add LDAP wizard opens so you can configure the connection, add mapping and roles, test LDAP settings, and add additional LDAP settings.
- To edit an LDAP entry, click its Provider link.
- To delete an LDAP entry, click the Delete link next for the provider.



For more information on setting up LDAP providers, refer to the ioSphere documentation available at <http://support.fusionio.com/downloads>

ALERTS

The Alerts menu helps users manage ION Accelerator alerts.

Rules

Here you can create, edit, and review rules that generate alerts. A sample Rules screen is shown below.



For basic information on alerts, see [Handling ION Accelerator Alerts](#) earlier in this guide.



ALERT RULES + Add Rule

All | ! Warnings | ! Errors | i Info

Alert	Description	Creator	Status	Delete
i Cluster degraded.	A host has left the ION Cluster.	Manag...	✔ Enabled	
! Host left the ION Cluster.	The host has left the ION Cluster.	Manag...	✔ Enabled	
i Cluster restored.	The ION Cluster has been restored.	Manag...	✔ Enabled	
! The appliance left the clust	Refer to the Knowledgebase, User Guides, or Cus...	Manag...	✔ Enabled	
! Kernel error on cluster nod	The cluster node has encountered a kernel error a...	Manag...	✔ Enabled	
! Unsupported device firmw:	A system device is operating with unsupported fir...	Manag...	✔ Enabled	
! Cluster communication un	The redundant cluster communication link is down.	Manag...	✔ Enabled	
! Fatal hardware failure	A non-correctable hardware failure has been dete...	Manag...	✔ Enabled	
! Cluster communication de	A single path of the redundant cluster communicat...	Manag...	✔ Enabled	
! Kernel memory problem	A kernel memory problem has been detected and ...	Manag...	✔ Enabled	

Page 1 of 11 | ▶ ▶▶ ↺ ↻ | Displaying 1 - 10 of 108

The following columns are available:

- Alert – Name of the alert
- Description – Cause for the alert, or additional information
- Creator – Source of the alert rule
- Status – Enabled or Disabled
- Delete – A “delete” link for each custom-created rule (system rules cannot be deleted)

Adding Rules

To add a custom alert rule that will fire the specified alert,

1. Click the **Add Rule** link. The **Add Alert** dialog appears.

ADD ALERT X CLOSE

ALERT PARAMETERS

or



2. Click **Add search parameter**. The **Choose Attribute** button appears.

The screenshot shows a rectangular box with a light gray background. At the top, it says "ALERT PARAMETERS" in a darker gray box. Below that, there is a button labeled "Choose Attribute..." with a small downward arrow on the right side.

If you need to add more attributes for your alert rule, click the Add Search Parameters link as many times as necessary.

3. Click the **Choose Attribute** button and select an attribute from the drop-down list.

Repeat the process for any additional **Choose Attribute** buttons you have displayed. (Conditions for all attributes must be met in order for the alert to fire.) A sample attribute group is shown below.

The screenshot shows two rows of configuration. The first row has a dropdown menu with "Agent Version" selected, followed by a dropdown with "contains" and a text input field with "4". To the right is a red trash icon. The second row has a dropdown menu with "Cluster IP Address" selected, followed by a dropdown with "is" and a text input field with "10.1.1.1". To the right is another red trash icon.

If you need to remove an attribute from the search, click the Trash icon next to it.

4. Click **Next Step** to display the **Add Alert** dialog.

The screenshot shows a dialog box titled "ADD ALERT" with a close button "X CLOSE" in the top right. Below the title bar, there is a section "ALERT PARAMETERS" with a link "Edit Parameters" on the right. Underneath, there are two attribute boxes: "Agent Version contains 4" and "Cluster IP Address is 10.1.1.1", each with a small 'x' icon to its right. Below this is a section "GENERAL INFORMATION AND SUBSCRIBERS" with the following fields: "Alert Type:" with a dropdown menu set to "Info"; "Alert Name:" with an empty text input field; "Alert Description:" with an empty text input field; and "Alert Status:" with a checked checkbox labeled "Enabled". At the bottom right, there are two buttons: "Add Alert" and "Cancel".

5. In the Alert Type box, select Info, Warning, or Error.
6. Type the Alert Name (to display in column 1 of the Alert Rules screen) and the Alert Description (to display in column 2).
7. Check "Enabled" if you want to enable the alert rule.



If you need to go back and change the parameters you selected, click the Edit Parameters link and make the necessary changes.



- Click **Add Alert** to add the alert rule.

Editing and Deleting Custom Alert Rules

- To edit a custom rule entry, click the **Rule** link.
- To delete a custom rule entry, click on the **Delete** link next to the Rule.

Only custom rules can be modified and deleted; you cannot change system rules.

SMTP Server

In order for ION Accelerator to send alert emails, you must first configure the SMTP server settings here.

SMTP SERVER

An SMTP server is required to receive alert notifications.

Sender

Sender Name: (optional)

Sender Email:

SMTP Server Address

Server Host Name:

Server Port Number:

Use SSL: Yes, use SSL.

Authentication

Username:

Password:

Fill in the fields in the SMTP Server dialog and click **Save Changes**. All fields are required except Sender Name and Use SSL.

SNMP Settings

The Configure SNMP screen enables you to configure SNMP for the ION Accelerator appliance. If you already have an ION Accelerator cluster, the settings are automatically copied to all of the cluster nodes.



CONFIGURE SNMP

Enable SNMP	<input checked="" type="checkbox"/>
Location	Server Room
Contact Information	Sysadmin (root@localhost)
Community	public
Client Address	127.0.0.1
Trap Community	public
Trap Address	<input type="text" value="IPv4 address or hostname"/>

[Download MIB files](#)

To configure SNMP,

1. If you want to disable SNMP (enabled by default), clear the Enable SNMP checkbox.
2. In the Location field, enter the SNMP host or cluster name. By default, this field contains the host or cluster name assigned in the First Boot process.
2. To specify contact information (such as an e-mail address) for the person being notified of the SNMP traps, complete the Contact Info field.
3. To identify the SNMP community who can access the appliance, complete the Community field. The default value is "public".
4. In Client Address, specify the IP address, or address mask, for where the SNMP traps should be sent.
5. To identify the SNMP community where SNMP traps will be sent, complete the Trap Community field. The default value is "public".
6. To specify the address where SNMP traps will be sent, enter the IPv4 address or hostname in the Trap Address field.

To specify an additional address (up to four may be used), click the green "plus" icon to display another entry field:

To delete an SNMP trap address, click the red trashcan icon to the right of the entry.



7. You can click the “Download MIB files” to download a .zip file containing the main .MIB file (fioIoDimm.MIB) and supporting files to your default download folder. The fioIoDimm.MIB file is discussed in [Appendix D: SNMP MIB Information](#).
8. Click **Save Changes**.

Subscribers

ION Accelerator can send email alerts to standard or SMS email addresses. After configuring the SMTP server settings, you can create subscribers and assign them to receive specific alerts.

Add Subscriber

1. Click the **Add Subscriber** link at the top of the Subscriber screen to display the **Add Subscriber** dialog.

ADD SUBSCRIBER X CLOSE

SUBSCRIBER

Enter a standard or SMS email to send alerts to.

Email:

Name: (optional)

Enable Subscriber: Allow alert notifications to be sent to this subscriber.

Subscriptions (optional)

All | Warnings | Errors | Info

Notify when **Set and Cleared**

Minimal mode: Dual plane not supported.	<input type="checkbox"/>
Lifespan write governing activated.	<input type="checkbox"/>
PCI express non-correctable errors were encountered.	<input type="checkbox"/>
Bypass mode: Write-invalidate-erase failure.	<input type="checkbox"/>
Minimal mode: Insufficient memory.	<input type="checkbox"/>
Configuration Error.	<input type="checkbox"/>
RAID has no spares and is vulnerable if a subsequent failure occurs.	<input type="checkbox"/>
Completely write throttled. Internal failure.	<input type="checkbox"/>
Completely write throttled. User requested.	<input type="checkbox"/>

Add Subscriber Cancel

2. In the Email field, enter a standard or SMS email address to designate where to send alerts to.
3. If desired, enter the subscriber name. You can also disallow alert notifications to the subscriber; they are enabled by default.



4. If you want to notify this subscriber when an alert is set or cleared, check the corresponding box under "Notify when Set and Cleared". When the "Set" box is selected, the "Cleared" box can also be selected.

Notify when Set and Cleared	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Editing and Deleting Subscribers

In the Subscribers page,

- To edit a subscriber, click the subscriber email address link.
- To delete a subscriber, click the **Delete** link next to the subscriber.



Most mobile carriers offer free Email-to-SMS gateways that can be used to forward simple text emails to mobile phones. Check with your provider to determine your Email-to-SMS email address.



Customer Support

Please register for Customer Support at <http://support.fusionio.com>.

Support is then available via e-mail at:

support@fusionio.com

or by phone at:

877.816.5740 (U.S.) or +1.801.424.5474 (International)

More information on troubleshooting is contained in [Collecting System Logs](#) in the *Getting Host Information* section of this guide.



Glossary of Terms

Host – Generally refers to an independent machine that may or may not contain ioMemory devices.

Initiator – An initiator of I/O is analogous to a client in a client/server system. Initiators use a SCSI transport protocol to access block storage over a network. A database or mail server is an initiator, for example.

IQN – iSCSI Qualified Name for a port, consisting of “IQN”, the date in YYYY-MM format, the reversed domain name (such as “org.acme”), and an optional storage target name.

LUN – Logical Unit Number. A LUN is usually synonymous with a virtual volume or physical disk drive. In ION Accelerator, a LUN is an exported path of an ION volume, between the ION target port and the client initiator port. One ION Accelerator volume can have multiple LUNs.

Port – A physical location on a piece of hardware in a slot. For example, a target port may be referenced as slot 1, port 1.

Storage Pool – An aggregation of IoMemory or RAID block devices. Block devices can be added to a pool. Pools are created by a storage profile, and they may reside on an ION host or HA cluster. For HA, storage pools are created on both nodes of a cluster but are referenced on only one of the HA nodes.

Storage Profile – A pre-determined group of settings that the user selects when creating a storage pool. The storage profile is an attribute of the storage pool.

Target – The opposite of an initiator. It is a receiver of I/O operations, analogous to a server in a client/server system. The target for I/O is the provider of (network) storage - a SAN disk array is a traditional target. ION Accelerator is an all-flash storage target by comparison.

Volume – A logical construct identifying a unit of data storage. A volume is allocated to allow for expandability within the space constraints of a pool. For ION Accelerator, a volume is not necessarily directly linked to a physical device.

WWPN – World-Wide Port Number; an ID that uniquely identifies a Fibre Channel port.



Appendix A: WEEE Advisement Disposal and Acknowledgment

In 2002 the European Union introduced the Directive on Waste Electrical and Electronic Equipment (WEEE). The main aim of the Directive is to ensure that WEEE is collected and treated separately. WEEE may contain hazardous substances that should not end-up in the (human) environment and can have adverse effects on it if they do.

Furthermore, WEEE is a vast source of raw materials. With the ever rising worldwide demand for new equipment and the ever decreasing volume of natural raw materials, letting this potential source go to waste is unacceptable.

If equipment is collected separately, the equipment can be recycled and up to 85 to 90% of the equipment can be re-used as new material, saving the use of virgin raw materials and energy of producing these.

For above reasons, Fusion-io expects customers to dispose of the material in an environmentally friendly way. Electrical and Electronic Equipment is labeled with the following "crossed-out, wheeled-bin" symbol indicating that the equipment should be disposed of, by the end user, separate from other types of waste.



The EU Directive and national legislation define various situations and financing options for doing so. Customers should contact their sales representative/dealer/distributor and our company on disposal, collection and recycling options and terms and conditions in your country.



Appendix B: Changing Node Names and IP Addresses

This section explains how to change the names or IP addresses for ION Accelerator nodes once they have been configured in the First Boot process. For details on using the `system:setup` command referred to in this section, refer to the *ION Accelerator Appliance CLI Reference Guide*.

Changing a Node Name in a Cluster



Changing a node name requires cluster downtime.

1. Ensure that both nodes are up.
2. Close all active sessions by disabling or disconnecting all target ports.
3. In the CLI, run `system:setup lan` to display the Setup dialog for LAN configuration.
4. Change the name of the node in the dialog.
5. Select **OK** and press **Enter**. Both nodes will restart, one at a time.
6. Repeat the previous two steps for the second node in the cluster.

Changing the Management IP Address

1. Ensure that both nodes are up.
2. In the CLI, run `system:setup lan` to display the Setup dialog for LAN configuration.
3. Change the management IP address in the dialog.
4. Select **OK** and press **Enter**. The node with the cluster IP address will fail over to the other node.

Changing the ION Accelerator Cluster Name or Cluster IP Address

1. Ensure that both nodes are up.
2. In the CLI, run `system:setup cluster` to display the Setup dialog for cluster configuration.
3. Change the cluster name in the dialog.



4. Select **OK** and press **Enter**.

Changing the Gateway IP Address

1. Ensure that both nodes are up.
2. In the CLI, run `system:setup lan` to display the Setup dialog for LAN configuration.
3. Click the **Routing** tab in the dialog.
4. Change the gateway IP address.
5. Select **OK** and press **Enter**.

Changing the IP Addresses for Cluster Interconnect Ports



You can change interconnect ports *only* when no cluster resources are configured.

1. Ensure that both nodes are up.
2. In the CLI, run `system:setup lan` to display the Setup dialog for LAN configuration.
3. Change the cluster interconnect IP address in the dialog.
4. Select **OK** and press **Enter**.
5. Restart both nodes.

Changing the iSCSI Port IP Address

1. Ensure that both nodes are up.
2. In the CLI, run `system:setup lan` to display the Setup dialog for LAN configuration.
3. Change the iSCSI port IP address in the dialog.
4. Select **OK** and press **Enter**.
5. Add the new target session to the initiator by running the following command:

```
iscsiadm -m discovery -t st -p <new iSCSI IP address> <new iSCSI IP address> <iqn:eth#>
```

6. Log in to the target (all sessions) from the initiator:

```
iscsiadm -m node -l
```

7. Run the CLI command `initiators -dt` to display the new initiator.

8. Add this initiator to an existing initiator group:

```
initiator:update -a <inigroup name> <initiator iqn>
```



Appendix C: System Alert Rules and Alert Parameters

This appendix lists the Error and Warning alerts for ION Accelerator, as well as parameters or attributes you can choose from to build custom alerts.

ERRORS

Alert	Description
Host left the ION Cluster.	Host left the ION Cluster.
The appliance left the cluster due to an unexpected failure.	Refer to the Knowledgebase, User Guides, or Customer Support to correct the problem.
Missing ioMemory	The cache ioMemory device is missing and is not functional. Make sure the ioMemory device is present in the appliance. Refer to the Knowledge Base, User Guides or Customer Support to resolve the problem.
Kernel error on cluster node	The cluster node has encountered a kernel error and should be rebooted to correct the problem.
Configuration Error	An error occurred while performing a configuration operation.
Cluster communication unavailable	The redundant cluster communication link is down.
Fatal hardware failure	A non-correctable hardware failure has been detected and the hardware may need to be replaced. Refer to Customer Support to correct the problem.
Incompatible PCI slot bandwidth	The bandwidth of the PCI slot is incompatible with the ioMemory. Refer to the Knowledgebase, User Guides, or Customer Support to correct the problem.



Alert	Description
Partially write throttled. Reason unavailable.	The ioMemory device has reduced its write performance. No reason given. Refer to the Knowledge Base, User Guides or Customer Support to resolve the problem.
Partially write throttled. User requested.	The ioMemory device has reduced its write performance. Write throttling set by user. Correct this condition to restore write operations.
Partially write throttled. Out of index space.	The ioMemory device has reduced its write performance. Out of index space. Promptly replace the device after backing up its data.
Partially write throttled. Out of available memory.	The ioMemory device has reduced its write performance. Out of available memory. Increase the amount of server memory or reduce the number of running applications, then reboot to continue.
Partially write throttled. Groomer failure.	The ioMemory has reduced its write performance. Groomer could not free enough blocks to continue. Review the errors in the driver logs and correct this prior to rebooting. Refer to the Knowledgebase, User Guides, or Customer Support to correct the problem.
Partially write throttled. Hardware failure experienced.	The ioMemory device has reduced its write performance. NAND chip hardware failure experienced. Promptly replace the device after backing up its data.
Partially write throttled. Close to wearout.	The ioMemory device has reduced its write performance. Close to wearout. Formatting to a smaller size will free up reserve. Replace the device after backing up its data, or refer to the Knowledge Base, User Guides or Customer Support to resolve the problem.
Partially write throttled. Power limit.	The ioMemory has reduced its write performance. ioMemory exceeds the PCIe power specification. Refer to the Knowledgebase, User Guides, or Customer Support to correct the problem.
Partially write throttled. No auxiliary power.	The ioMemory device has reduced its write performance. No auxiliary power cable is connected. Shut down and turn off power to the server, connect the auxiliary power cable to the device, and reboot the server.
Partially write throttled. Internal failure.	The ioMemory device has reduced its write performance. Internal failure. Refer to the Knowledge Base, User Guides or Customer Support to resolve the problem.



Alert	Description
Completely write throttled. User requested.	The ioMemory is not allowing write operations. Write throttling set by user. Correct this condition to restore write operations.
Completely write throttled. Reason unavailable.	The ioMemory is not allowing write operations. No reason given. Refer to the Knowledgebase, User Guides, or Customer Support to correct the problem.
Completely write throttled. Internal failure.	The ioMemory is not allowing write operations. Internal failure. Refer to the Knowledgebase, User Guides, or Customer Support to correct the problem.
Completely write throttled. Close to wearout.	The ioMemory is not allowing write operations. Close to wearout. Formatting to a smaller size will free up reserve. Replace the device after backing up its data or refer to the Knowledgebase, User Guides, or Customer Support to correct the problem.
Completely write throttled. Hardware failure experienced.	The ioMemory is not allowing write operations. NAND chip hardware failure experienced. Promptly replace the device after backing up its data.
Completely write throttled. Power limit.	The ioMemory device is not allowing write operations. ioMemory exceeds the PCIe power specification. Refer to the Knowledge Base, User Guides or Customer Support to resolve the problem.
Completely write throttled. No auxiliary power.	The ioMemory is not allowing write operations. No auxiliary power cable is connected. Shut down and turn off power to the server, connect the auxiliary power cable to the device, and reboot the server.
Completely write throttled. Out of available memory.	The ioMemory is not allowing write operations. Out of available memory. Increase the amount of server memory or reduce the number of running applications, then reboot to continue.
Completely write throttled. Groomer failure.	The ioMemory device is not allowing write operations. Groomer could not free enough blocks to continue. Review the errors in the driver logs and correct this prior to rebooting. Refer to the Knowledge Base, User Guides or Customer Support to resolve the problem.
Completely write throttled. Out of index space.	The ioMemory is not allowing write operations. Out of index space. Promptly replace the device after backing up its data.



Alert	Description
Volume access inconsistency on ION Cluster.	The volume does not have the same initiator access on each of the cluster hosts.
ioMemory Inconsistency on ION Cluster.	Cluster hosts have ioMemory that differs in count, type, or capacity.
Split Brain	Multiple cluster hosts believe they are active and the other is offline.
Internal error	The ioMemory device has encountered an internal error and has been temporarily disabled. All reads and writes will fail. Refer to the Knowledge Base, User Guides or Customer Support to resolve the problem.
VCCaux voltage is out of range.	VCCaux voltage is out of range. All reads and writes will fail. Refer to the Knowledge Base, User Guides or Customer Support to resolve the problem.
Temperature at a critical level.	The temperature of this device is at a critical threshold. All reads and writes will fail. Refer to the Knowledge Base, User Guides or Customer Support to resolve the problem.
Incompatible PCI slot bandwidth	The bandwidth of the PCI slot is incompatible with ioMemory. Refer to the Knowledge Base, User Guides or Customer Support to resolve the problem.
Flashback protection not available.	The ioMemory has exhausted its flashback protection. Promptly replace the device after backing up its data. Refer to the Knowledge Base, User Guides or Customer Support to resolve the problem.
Temperature has surpassed a critical level.	The temperature of this device has surpassed a critical threshold. All reads and writes will fail. Refer to the Knowledge Base, User Guides or Customer Support to resolve the problem.
PCI express non-correctable errors were encountered.	PCIe non-correctable errors were encountered. Refer to the Knowledge Base, User Guides or Customer Support to resolve the problem.
Unsupported device firmware	A system device is operating with unsupported firmware. Download the system logs and refer to Customer Support to correct the problem.



Alert	Description
VCCint voltage is out of range.	VCCint voltage is out of range. All reads and writes will fail. Refer to the Knowledge Base, User Guides or Customer Support to resolve the problem.
Volume has diverged from its peer.	Volume has diverged from its peer.
Volume Inconsistency on ION Cluster.	The volume does not exist on all cluster hosts.
RAID is in a failed state.	Refer to the Knowledgebase, User Guides, or Customer Support to correct the problem.
Pool is in a failed state due to failed RAID.	Pool is in a failed state due to failed RAID.
Storage Pool Inconsistency on ION Cluster.	The storage pool does not exist on all cluster hosts.
Host clock drastically out of sync.	The host's clock is over a day different from the management server's clock. Operations requiring a license may exhibit undefined behavior.
Temperature exceeding threshold.	The temperature sensor is exceeding its threshold. Provide more cooling to the area.
Chassis cooling is insufficient.	The chassis cannot properly cool all components. Repair or install cooling devices.
The power supply has failed.	The power supply has failed. Repair or replace the power supply.
Chassis power is insufficient.	The chassis cannot properly supply power to all components. Repair or install power supplies.
The fan has failed.	The fan has failed. Repair or replace the fan.
Boot RAID is in a failed state.	Refer to the Knowledgebase, User Guides, or Customer Support to correct the problem.



WARNINGS

Alert	Description
Host clock out of sync.	The host's clock is over an hour different from the management server's clock. Data graphs may exhibit undefined behavior.
Kernel memory problem	A kernel memory problem has been detected and the system should be rebooted to correct the problem. Download the system logs and send to Customer Support for further review.
Pool has a RAID which has no spares and is vulnerable if a subsequent failure occurs.	Refer to the Knowledgebase, User Guides, or Customer Support to correct the problem.
Temperature high.	The temperature of this device is approaching a critical threshold. If exceeded, further write operations will be prevented. Refer to the Knowledge Base, User Guides or Customer Support to resolve the problem.
Missing LEB map.	The ioMemory device is missing an LEB map. Refer to the Knowledge Base, User Guides or Customer Support to resolve the problem.
Lifespan write governing activated.	Write lifespan governing activated, performance may be limited. If this condition persists, reduce write load or consider an ioMemory device with a higher volume rating. Refer to the Knowledgebase, User Guides, or Customer Support to correct the problem.
Power loss protection disabled.	Power loss protection has been disabled on this device, introducing the risk of data corruption in the event of a power failure. Refer to the Knowledge Base, User Guides or Customer Support to resolve the problem.
Close to wearout.	The ioMemory device is close to wearing out – reduced-write mode is triggered when reserve is depleted.
Media upgrade in progress.	A media upgrade is in progress. The ioMemory device will not be usable until it is low-level formatted. Refer to the Knowledge Base, User Guides or Customer Support to resolve the problem.



Alert	Description
Power write governing activated.	Power write governing activated, performance may be limited. If this condition persists, switch to a higher powered PCIe slot or attach external power cable.
Sub-optimal PCI slot bandwidth.	The bandwidth of the PCI slot is not optimal for the ioMemory device. Refer to the Knowledge Base, User Guides or Customer Support to resolve the problem.
Reserve is depleted.	The ioMemory device reserve is depleted – reduced-write or read-only mode will be triggered when device is attached. Formatting to a smaller size will free up reserve. Refer to the Knowledge Base, User Guides or Customer Support to resolve the problem.
Over PCIe power budget alarm triggered.	Over PCIe power budget alarm triggered. Refer to the Knowledge Base, User Guides or Customer Support to resolve the problem.
Thermal write governing activated.	Thermal write governing activated, performance may be limited.
PCI errors	PCIe correctable errors were encountered. Refer to the Knowledge Base, User Guides or Customer Support to resolve the problem.
Minimal mode: Unknown reason	The ioMemory device is currently running in a minimal state. Unknown reason. Refer to the Knowledge Base, User Guides or Customer Support to resolve the problem.
Minimal mode: Hardware failure.	The ioMemory is currently running in a minimal state. Device has a hardware failure. Refer to the Knowledgebase, User Guides, or Customer Support to correct the problem.
Minimal mode: Channel init fail.	The ioMemory is currently running in a minimal state. General channel initialization failure. Refer to the Knowledgebase, User Guides, or Customer Support to correct the problem.
Minimal mode: Driver out of date.	The ioMemory is currently running in a minimal state. The currently installed version of the driver is not compatible with this device. Refer to the Knowledgebase, User Guides, or Customer Support to correct the problem.



Alert	Description
Minimal mode: Firmware out of date	The ioMemory device is currently running in a minimal state. The firmware on this device is not compatible with the currently installed version of the driver. Please use the Update Firmware operation to update the firmware. Otherwise, refer to the Knowledge Base, User Guides or Customer Support to resolve the problem.
Minimal mode: Unsupported NAND.	The ioMemory device is currently running in a minimal state. Device has unsupported NAND. Refer to the Knowledge Base, User Guides or Customer Support to resolve the problem.
Minimal mode: Insufficient memory.	The ioMemory is currently running in a minimal state. Device is currently running in a minimal state because there is not enough memory to load the driver. Add additional memory or disable the page file on this device if the page file is enabled. Otherwise, refer to the Knowledgebase, User Guides, or Customer Support to correct the problem.
Minimal mode: Internal problem.	The ioMemory device is currently running in a minimal state. Device has encountered an internal error and is currently running in a minimal state. Refer to the Knowledge Base, User Guides or Customer Support to resolve the problem.
Minimal mode: Insufficient power.	The ioMemory device is currently running in a minimal state. Device requires supplemental power. Power down the computer, connect the supplemental power adapter to the device, and restart the computer. Otherwise, refer to the Knowledge Base, User Guides or Customer Support to resolve the problem.
Minimal mode: SMP boot mode.	The ioMemory device is currently running in a minimal state. Device is in SMP bootloader mode. Attempt to update the firmware. Otherwise, refer to the Knowledge Base, User Guides or Customer Support to correct the problem.
Minimal mode: Card limit exceeded.	The ioMemory device is currently running in a minimal state. Only a limited number of this type of device may be used on this system. Refer to the Knowledge Base, User Guides or Customer Support to correct the problem.



Alert	Description
Minimal mode: User forced.	The ioMemory is currently running in a minimal state. The ioMemory is currently running in a minimal state because it was placed in that state by a user. Refer to the Knowledgebase, User Guides, or Customer Support to correct the problem.
Minimal mode: Dual plane not supported.	The ioMemory device is currently running in a minimal state. Device has been configured for dual-plane mode but does not support dual-plane mode. Refer to the Knowledge Base, User Guides or Customer Support to correct the problem.
Minimal mode: Missing midprom data.	The ioMemory device is currently running in a minimal state. Device is missing midprom data. Refer to the Knowledge Base, User Guides or Customer Support to correct the problem.
Minimal mode: Unsupported Operating System.	The ioMemory device is currently running in a minimal state. Device will not function on the current operating system. Refer to the Knowledge Base, User Guides or Customer Support to correct the problem.
Minimal mode: Fallback firmware.	The ioMemory is currently running in a minimal state. Board running on FALLBACK firmware image. Refer to the Knowledgebase, User Guides, or Customer Support to correct the problem.
Power write governing activated.	Power write governing activated, performance may be limited. If this condition persists, switch to a higher powered PCIe slot or attach external power cable.
Cluster communication degraded	A single path of the redundant cluster communication link is disconnected.
Thermal write governing activated.	Thermal write governing activated, performance may be limited. If this condition persists, increase air flow, lower room temperature or reduce write load.
System problem detected	The system has encountered an unexpected issue and a reboot is recommended to correct the problem. If this condition persists, refer to Customer Support for further review.
Pool is running in a degraded state due to failed RAID (not rebuilding).	Pool is running in a degraded state due to failed RAID (not rebuilding).



Alert	Description
Pool is running in a degraded state due to failed RAID and is rebuilding.	Pool is running in a degraded state due to failed RAID and is rebuilding.
RAID has no spares and is vulnerable if a subsequent failure occurs.	Refer to the Knowledgebase, User Guides, or Customer Support to correct the problem.
Volume is not in sync with its peer.	Check the status of each host in the cluster and reboot or repair the failed cluster host. Otherwise, refer to the Knowledgebase, User Guides, or Customer Support to correct the problem.
Volume is re-synchronizing with its peer.	Volume is re-synchronizing with its peer.
A port is disconnected.	A port is disconnected.
RAID is running in a degraded state (not rebuilding).	RAID is running in a degraded state (not rebuilding).
RAID is running in a degraded state and is rebuilding.	Refer to the Knowledgebase, User Guides, or Customer Support to correct the problem.
A previously connected port has been disconnected.	A previously connected port has been disconnected.
Some of the previously connected ports have been disconnected.	Some of the previously connected ports have been disconnected.
Chassis cooling is not redundant.	One or more fans do not have a backup. Repair or install redundant fans.
Temperature near threshold.	The temperature sensor is nearing its threshold. Provide more cooling to the area.
Non-critical power supply condition.	A non-critical condition is present on the power supply. Repair or replace the power supply.
Non-critical fan condition.	A non-critical condition is present on the fan. Repair or replace the fan.
Chassis power is not redundant.	One or more power supplies do not have a backup. Repair or install redundant power supplies.
Boot RAID is running in a degraded state (not rebuilding).	Refer to the Knowledgebase, User Guides, or Customer Support to correct the problem.



Alert	Description
Boot RAID has no spares and is vulnerable if a subsequent failure occurs.	Refer to the Knowledgebase, User Guides, or Customer Support to correct the problem.

ALERT PARAMETER ATTRIBUTES

These attributes are available in the Choose Attributes drop-down lists of the Add Rule dialog, in the Settings tab.

Category	Alert Attribute
Adapter	Adapter Board Kind, Adapter PCI Slot Power, Adapter PCIe Bandwidth, Adapter PCIe Link Speed, Adapter PCIe Link Width, Adapter S/N, External Power, Min Volts, PCIe Power Limit, Peak Amps, Peak Volts, Peak Watts, Power Amps, Power Monitoring, Power Volts, Power Watts
Cluster	Cluster IP Address, Cluster Name
Driver Firmware	Current Firmware Revision, Current Firmware Version, Driver Version, Minimum Firmware Revision
Formatting & Volume	Format UUID, Formatted Size, Sector Count, Sector Size
Hardware	Alt Part Number, Board Kind, Device Label, Device Name, Device S/N, ECC Bytes per Codeword, ECC Num Bits Correctable, Factory Capacity, Location within Adapter, Part Number, Port within Adapter, Product Name, Product SKU, Product Serial Number, ioMemory S/N
Host	Agent Version, Host IP, Host OS, Host Offline Since, Host Online, Hostname, OS Native Trim Active, Trim Enabled, Trim Service Active
PCI	PCI Device ID, PCI Slot Number, PCI Slot Power, PCI Subsys Device ID, PCI Subsys Vendor ID, PCIe Bandwidth, PCIe Link Speed, PCIe Link Width
Performance/Status	Active Media, Alias, Current Operation, Current Operation Phase, Current Operation Progress, Current RAM Used, FPGA Temperature, Host Online, Peak RAM Used, Reserve Space, Session Read Ops, Session Write Ops, State, Total Physical Read, Total Physical Written, ioMemory
Settings	Beacon Status, Swap Support



Appendix D: SNMP MIB Information

This appendix describes most of the fields in the `fusionIoDimm.MIB` file included in the ION Accelerator software. For more information on SNMP configuration, see [SNMP Settings](#) in *Configuring ION Accelerator Settings* earlier in this guide.

Name	Description	Data Type
<code>fusionIoDimmMibRevMajor</code>	MIB major version. This will increment when incompatible structural changes occur.	Integer
<code>fusionIoDimmMibRevMinor</code>	MIB minor version. This will increment when minor additions occur.	Integer
<code>fusionIoDimmMIBCondition</code>	Overall MIB condition	1=other; 2=OK; 3=degraded; 4=failed

Name	Description	Data Type
<code>fusionIoDimmInfoTable</code>	There will be an entry in this table for each ioDrive device installed.	Sequence of <code>fusionIoDimmInfoEntry</code>
<code>fusionIoDimmInfoEntry</code>	Each entry represents an ioDrive device.	<code>FusionIoDimmInfoEntry</code>
<code>fusionIoDimmInfoIndex</code>	Unique index for ioDrive entries	Integer (1-256)
<code>fusionIoDimmInfoStatus</code>	Overall status of the ioDrive device	1=other; 2=OK; 3=degraded; 4=failed
<code>fusionIoDimmInfoName</code>	System control device name for this device	Display string (0-25)
<code>fusionIoDimmInfoSerialNumber</code>	Serial number of this device	Display string (0-50)
<code>fusionIoDimmInfoPartNumber</code>	System part number of this device	Display string (0-50)
<code>fusionIoDimmInfoSubVendorPartNumber</code>	Sub-vendor system part number of this device	Display string (0-50)
<code>fusionIoDimmInfoSparePartNumber</code>	Spare part number of this device	Display string (0-50)



Name	Description	Data Type
fusionIoDimmInfoAssemblyNumber	Assembly number of this device (HW revision)	Display string (0-50)
fusionIoDimmInfoFirmwareVersion	Firmware version of this device	Display string (0-50)
fusionIoDimmInfoDriverVersion	Device driver version	Display string (0-50)
fusionIoDimmInfoUID	Device UID written at format time	Display string (0-50)
fusionIoDimmInfoState	<p>Current state of the attached client device. In order to function normally, the device must be in the attached state.</p> <p>Quiescent states:</p> <p>attached = device is ready for normal use; detached = device is stopped; minimal = ioMemory VSL loaded but firmware needs updating; error = device is not working properly</p> <p>Transitional states:</p> <p>attaching = device is initializing; scanning = part of device initialization; detaching = device is stopping; formatting = the format operation is in process; updating = the firmware is being updated</p> <p>Operations:</p> <p>attach = make device operational; detach = take device off-line; format = re-formats device; update = firmware update</p> <p>The device state must be minimal or detached to update the firmware and must be detached in order to format.</p>	<p>Integer:</p> <p>unknown(0) detached(1) attached(2) minimal(3) error(4) detaching(5) attaching(6) scanning(7) formatting(8) updating(9) attach(10) detach(11) format(12) update(13)</p>
fusionIoDimmInfoClientDeviceName	Name of the attached client device.	Display string (0-25)



Name	Description	Data Type
fusionIoDimmInfoBeacon	Writing a true value here will turn on the LED flashing beacon for visual card identification. A false value will turn the LED beacon off.	Boolean
fusionIoDimmInfoPCIAddress	Device address on the PCI bus	Display string (0-15)
fusionIoDimmInfoPCIDeviceID	Device PCI ID	Display string (0-25)
fusionIoDimmInfoPCISubdeviceID	Device PCI sub-device ID	Display string (0-25)
fusionIoDimmInfoPCIVendorID	Device PCI vendor ID	Display string (0-25)
fusionIoDimmInfoPCISubvendorID	Device PCI sub-vendor ID	Display string (0-25)
fusionIoDimmInfoPCISlot	Device PCI slot number	Display string (0-16)
fusionIoDimmInfoWearoutIndicator	True = device has surpassed the wearout threshold.	Boolean
fusionIoDimmInfoFlashbackIndicator (relevant only for driver 2.3.1 and earlier)	True = flashback redundancy is degraded.	Boolean
fusionIoDimmInfoWritableIndicator	0 = Write-reduced; 1= non-writable (read-only); 2=normal; 3=unknown	Integer (0-3)
fusionIoDimmInfoInternalTemp	Current internal temperature of the device in degrees Celsius	Integer (-100-100)
fusionIoDimmInfoHealthPercentage	Estimate of the health of the drive expressed as the remaining percentage of drive life before write rate is reduced due to wearout. If the health percentage is not available, the value will be set to -1.	Integer (0-100)
fusionIoDimmInfoShortTermWearoutDate	Obsolete	
fusionIoDimmInfoLongTermWearoutDate	Obsolete	
fusionIoDimmInfoShortTermNonWritableDate	Obsolete	
fusionIoDimmInfoLongTermNonWritable Date	Obsolete	
fusionIoDimmInfoMinimalModeReason	Reason the device is in minimal mode: 0=unknown; 1=firmware out of date; 2=low power; 3=dual-plane mode failed; 5=internal error; 6=card limit exceeded; 7=device not in minimal mode; 8=unsupported OS; 9=insufficient memory;	Integer (0-13)



Name	Description	Data Type
	10=bootloader mode; 11=missing midprom; 12=unsupported NAND; 13=driver out of date	
fusionIoDimmInfoReducedWriteReason	Reason the device is in reduced write mode: 0=none; 1=user request; 2=no metadata blocks; 3=out of memory; 4=die failure; 5=wearout; 6=limited adapter power; 7=internal error; 8=power limited; 9=unknown; 10=groomer failure	Integer (0-10)
fusionIoDimmInfoMilliVolts	Current voltage level of the PCIe 12-volt bus in millivolts. 0= value could not be determined.	Integer (0-65535)
fusionIoDimmInfoMilliVoltsPeak	Peak voltage level of the PCIe 12- volt bus in millivolts. 0= value could not be determined.	Integer (0-65535)
fusionIoDimmInfoMilliVoltsMin	Minimum voltage level of PCIe 12 volt bus in millivolts. 0= value could not be determined.	Integer (0-65535)
fusionIoDimmInfoMilliWatts	Current wattage drawn on the PCIe 12-volt bus in milliwatts. 0= value could not be determined.	Integer (0-65535)
fusionIoDimmInfoMilliWattsPeak	Peak wattage drawn on the PCIe 12-volt bus in milliwatts. 0= value could not be determined.	Integer (0-65535)
fusionIoDimmInfoMilliAmps	Amperage flowing on the PCIe 12-volt bus in milliamps. 0= value could not be determined.	Integer (0-65535)
fusionIoDimmInfoMilliAmpsPeak	Peak amperage flowing on the PCIe 12-volt bus in milliamps. 0= value could not be determined.	Integer (0-65535)
fusionIoDimmInfoAdapterType	Type of ioDimm adapter: 0=ioDrive; 1=ioDriveLowPro2; 2=ioDrive Duo; 3=ioSAN; 4=unknown; 5=ioOctal	Integer (0-5)
fusionIoDimmInfoAdapterPort	Port number of this ioDimm on the adapter. -1=the port number is not available.	Integer (-1-65535)
fusionIoDimmInfoAdapterSerialNumber	Serial number of the adapter where this ioDimm is connected.	DisplayString (0-50)



Name	Description	Data Type
fusionIoDimmInfoAdapterExtPowerPresent	True=external power is connected on the adapter where this ioMemory module is connected.	Boolean
fusionIoDimmInfoPowerlossProtectDisabled	True=power loss protection is available but disabled.	Boolean
fusionIoDimmInfoInternalTempHigh	True=the internal temperature is nearing the maximum rating.	Boolean
fusionIoDimmInfoAmbientTemp	Current ambient temperature of the device in degrees Celsius.	Integer (-100-100)
fusionIoDimmInfoPCIBandwidthCompatibility	Bandwidth compatibility of the PCIe slot. If the value is not optimal, the status and condition variables will be set accordingly. 0=incompatible; 16=suboptimal; 2048= optimal; 32768=unknown	Integer
fusionIoDimmInfoPCIPowerCompatibility	Power compatibility of the PCI-E slot. If the value is not optimal, the status and condition variables will be set accordingly. 0=incompatible; 16=suboptimal; 2048= optimal; 32768=unknown	Integer
fusionIoDimmInfoActualGoverningLevel	Level of governing currently in effect on the device. This may be due to high temperature, power shortage, or to prolong life of the drive. 0=none; 1=light; 2=moderate; 3=heavy; 4=unknown	Integer
fusionIoDimmInfoLifespanGoverningLevel	Level of contribution for longevity. Governing may be impacted for the sake of prolonging longevity of the device. 0=none; 1=light; 2=moderate; 3=heavy; 4=unknown	Integer
fusionIoDimmInfoPowerGoverningLevel	Level of contribution due to lack of power. Governing may be impacted due to a lack of power available to the device. 0=no governing active; 1=light governing; 2= moderate governing; 3= heavy governing; 4=governing level unavailable	Integer



Name	Description	Data Type
fusionIoDimmInfoThermalGoverningLevel	Level of contribution due to high temperatures. Governing may be impacted due to the device reaching high temperatures. 0=no governing active; 1=light governing; 2= moderate governing; 3= heavy governing; 4=governing level unavailable	Integer
fusionIoDimmInfoLifespanGoverning Enabled	OBSOLETE	Boolean
fusionIoDimmInfoLifespanGoverningTgtDate	OBSOLETE	Display string (0-25)
fusionIoDimmInfoInternalTempCritical	True=temperature is at a critical level.	Boolean
fusionIoDimmInfoInternalTempShutdown	True=temperature has surpassed a critical level, and the device will shut down.	Boolean
fusionIoDimmInfoPcieErrorsIndicator	True=uncorrectable PCIe errors have been detected on the PCIe bus.	Boolean
fusionIoDimmInfoMissingLebMapIndicator	True=the device is missing an LEB map and cannot be attached.	Boolean
fusionIoDimmInfoVccIntErrorIndicator	True=the device is experiencing a VccInt out-of-range error.	Boolean
fusionIoDimmInfoVccAuxErrorIndicator	True=the device is experiencing a VccAux out-of-range error.	Boolean
fusionIoDimmInfoOverPowerIndicator	True=the device is experiencing an over-power error. Plug in external power to solve the problem.	Boolean
fusionIoDimmInfoUpgradeInProgress Indicator	True=the device is currently in the process of being upgraded to a new major revision of the VSL driver.	Boolean
fusionIoDimmInfoInternalTempHigh Threshold	Threshold at which temperature will be considered high (warning level), and temperature-high trap will be fired	Integer
fusionIoDimmInfoInternalTempCriticalThreshold	Threshold at which temperature will be at a critical level, and a critical temperature trap will be fired	Integer



Name	Description	Data Type
fusionIoDimmInfoInternalTempShutdownThreshold	Threshold at which temperature will be at a shutdown level, and a critical temperature trap will be fired	Integer
fusionIoDimmInfoVirtualController Number	Number of this virtual controller on the physical ioMemory device	Integer
fusionIoDimmInfoVirtualControllerCount	Total number of active virtual controllers on the physical ioMemory device	Integer
fusionIoDimmInfoActiveMediaPercent	Total active media on the device, as a percent	Integer

Name	Description	Data Type
fusionIoDimmExtnTable	Fusion-io ioDrive extension table	Sequence OF FusionIoDimmExtnEntry
fusionIoDimmExtnEntry	Entry in the fusionIoDimmExtnTable	FusionIoDimmExtnEntry
fusionIoDimmExtnIndex	Unique index for the ioDrive extension table. There should be an entry in this table for each entry in the ioDrive table	Integer (1-256)
fusionIoDimmExtnTotalPhysCapacityU	Upper word of the total physical capacity in bytes	Counter
fusionIoDimmExtnTotalPhysCapacityL	Lower word of the total physical capacity in bytes	Counter
fusionIoDimmExtnUseablePhysCapacityU	OBSOLETE	Counter
fusionIoDimmExtnUseablePhysCapacityL	OBSOLETE	Counter
fusionIoDimmExtnUsedPhysCapacityU	OBSOLETE	Counter
fusionIoDimmExtnUsedPhysCapacityL	OBSOLETE	Counter
fusionIoDimmExtnTotalLogCapacityU	Upper word of the total logical capacity in bytes as formatted	Counter
fusionIoDimmExtnTotalLogCapacityL	Lower word of the total logical capacity in bytes as formatted	Counter
fusionIoDimmExtnAvailLogCapacityU	OBSOLETE	Counter
fusionIoDimmExtnAvailLogCapacityL	OBSOLETE	Counter
fusionIoDimmExtnBytesReadU	Upper word of the total number of bytes read since the device was formatted	Counter
fusionIoDimmExtnBytesReadL	Lower word of the total number of bytes read since the device was formatted	Counter



Name	Description	Data Type
fusionIoDimmExtnBytesWrittenU	Upper word of the total physical bytes written	Counter
fusionIoDimmExtnBytesWrittenL	Lower word of the total physical bytes written	Counter
fusionIoDimmExtnLogBytesWrittenU through fusionIoDimmExtnConfidenceInterval	OBSOLETE	Counter
fusionIoDimmExtnFormattedBlockSize	Block size that this device is formatted to use.	Integer (512 or 4096)
fusionIoDimmExtnCurrentRAMUsageU	Upper word of the current RAM usage in bytes for the drive	Counter
fusionIoDimmExtnCurrentRAMUsageL	Lower word of the current RAM usage in bytes for the drive	Counter
fusionIoDimmExtnPeakRAMUsageU	Upper word of the peak RAM usage in bytes for the drive	Counter
fusionIoDimmExtnPeakRAMUsageL	Lower word of the peak RAM usage in bytes for the drive	Counter

Name	Description	Data Type
fusionIoDimmCapacityTable	Table of usable physical capacity values over time	Sequence of fusionIoDimmCapacityEntry
fusionIoDimmCapacityEntry	Defines an entry of the usable physical capacity history table	FusionIoDimmCapacityEntry
fusionIoDimmCapacityInfoIndex	ioDrive index – correlates to the drive index in the info table.	Integer (1-256)
fusionIoDimmCapacityIndex	Unique index for the usable physical capacity log	Integer (1-1000)
fusionIoDimmCapacityValueU	Upper word of the physical usable capacity at this point in time	Counter
fusionIoDimmCapacityValueL	Lower word of the physical usable capacity at this point in time.	Counter
fusionIoDimmCapacityTimestamp	Time stamp of this value entry	SimpleTime

Name	Description	Data Type
fusionIoDimmWriteTable	Log of write volume history	Sequence of fusionIoDimmWriteEntry
fusionIoDimmWriteEntry	Entry in the write volume history table	fusionIoDimmWriteEntry
fusionIoDimmWriteInfoIndex	ioDrive index – correlates with the index in the info table.	Integer (1-256)
fusionIoDimmWriteIndex	Unique index for this write volume entry	Integer (1-1000)
fusionIoDimmWriteValueU	Upper word of the total physical number of bytes written at a given moment in time	Counter



Name	Description	Data Type
fusionIoDimmWriteValueL	Lower word of the total physical number of bytes written at a given moment in time	Counter
fusionIoDimmWriteTimestamp	Timestamp entry for this value	SimpleTime

Name	Description	Data Type
fusionIoDimmTempTable	Device temperature history table	Sequence of fusionIoDimmWriteEntry
fusionIoDimmTempEntry	Entry in the device temperature history	fusionIoDimmWriteEntry
fusionIoDimmTempInfoIndex	ioDrive index – correlates with the index in the info table.	Integer (1-256)
fusionIoDimmTempIndex	Unique index for this temperature log entry	Integer (1-1000)
fusionIoDimmTempValue	Current temperature of the device in degrees Celsius	Integer
fusionIoDimmTempTimestamp	Timestamp entry for this value	SimpleTime



Appendix E: About the ION Accelerator Appliance Guides

The *ION Accelerator Appliance GUI Guide* helps you use the ION Accelerator software in a GUI environment, including setting up a storage profile and pools, creating volumes, adding initiators, managing ioMemory, etc.

Other ION Accelerator guides include:

- *ION Accelerator Appliance Configuration Guide* – an introduction to the ION Accelerator software, as well information on first boot setup, host multipathing, and application tuning
- *ION Accelerator Appliance CLI Reference Guide* – an equivalent to the GUI guide, using a command-line interface for tasks