Dell Acceleration Appliance for Databases 2.0

Configuration Guide



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About this guide

This guide contains information about installing and configuring the Dell Acceleration Appliance for Databases (DAAD) software. This guide is intended for administrators responsible for server and storage systems. It is assumed the reader is familiar with basic server administration.

Typographical conventions

Convention	Usage	Examples
NOTE:	Important additional information or further explanation of a topic.	NOTE: A weekly backup is recommended.
CAUTION!	The task or operation might have serious consequences if conducted incorrectly or without appropriate safeguards. If you are not an expert in the use of this product, consult support for assistance.	CAUTION! Do not change configuration parameters.
Bold	A command or system input that you type, or text or a button you click on a graphical user interface (GUI).	Click Help for details about disaster recovery.
Italic	 Italic font indicates any of the following: A term with a specific meaning in the context of this document. Emphasis on specific information. Reference to another document. Variables in a syntax statement for 	Detailed information about disaster recovery methods is available in the Administrator Guide. network:ping <i>hostname</i>
Courier	System output, file names or path names. Bold Courier for commands typed by user.	<pre>> Recovery in progress network:ping 10.1.100.14</pre>
< > Angle Brackets	A required entry or variable parameter	installer- <version#>.run</version#>
Square [] Brackets	An optional entry or variable parameter.	tar [zxvf] file.tgz
Curly { } Brackets	A list of options separated by a the pipe symbol " " from which any one must be selected.	Click { OK Cancel }.

This document follows these conventions:

1

About DAAD configurations

The steps for configuring DAAD depend on the networking hardware that is installed in the appliance. Generally, DAAD can be configured for one of the following data networking protocols:

- Fibre Channel
- iSCSI
- InfiniBand (IB)

About Fibre Channel configurations

Fibre channel DAAD configurations consist of the following components:

- Four Fusion ioMemory devices that are either 3.2 TB or 6.4 TB capacity. (All the Fusion ioMemory devices in the DAAD are the same capacity.)
- Two dual-port fibre channel cards.
- Optionally, a ConnectX-3, 40 GbE, dual-port adapter for a high availability link between two DAAD systems.

Figure 1-1. DAAD Fibre Channel Configuration



Figure 1-2. DAAD HA Fibre Channel Configuration

ory 3.2 TB or 6.4 TB
6.4 TB
6.4 TB

About iSCSI configurations

iSCSI DAAD configurations for consist of the following components:

- Four Fusion ioMemory devices that are either 3.2 TB or 6.4 TB capacity. (All the Fusion ioMemory devices in the DAAD are the same capacity.)
- Two ConnectX-3 adapters used for iSCSI protocol connections to the DAAD
- Optionally, one ConnectX-3 adapter used for a high availability link between two DAAD systems.

Figure 1-3. DAAD iSCSI Configuration



Figure 1-4. DAAD HA iSCSI Configuration

		1 iscs	l HA (Eth)				
		2 iscsi	iscsi	5 ioMemory 3.2 TE	3 or 6.4 TB	7 ioMemory 3.2 TB or 6.4	
1	iSCSI	HA (Eth)	4 ioMem	nory 3.2 TB or 6.4 TB	6 ioMer	nory 3.2 TB or 6.4 TB	
2	iSCSI	iSCSI	5 ioMem	nory 3.2 TB or 6.4 TB	7 ioMer	mory 3.2 TB or 6.4 TB	
3	iSCSI	HA (Eth)					



About InfiniBand configurations

InfiBand DAAD configurations consist of the following components:

- Four Fusion ioMemory devices that are either 3.2 TB or 6.4 TB capacity. (All the Fusion ioMemory devices in the DAAD are the same capacity.)
- Two InfiniBand adapters used for IB protocol connections to the DAAD
- Optionally, for HA configurations, the system may be configured with three IB adapters with two ports on two of the adapters configured to be an Ethernet link between two DAAD systems in the cluster.





Figure 1-7. DAAD HA InfiniBand Configuration



About DAAD first boot

When booting DAAD for the first time,, perform some basic configuration tasks for the DAAD system. These tasks can be grouped into the following phases:

- Accepting the license agreement
- Configuring networking
- Setting clock and time zone
- Configuring HA clustering
- Setting the admin user password

The networking adapters installed in the your system will determine what is displayed on the Network Configuration screen. As directed in Table 2-1 on page 18, go to the section that matches the Network Configuration screen displayed on the console of your system.

Prerequisites

Before beginning, ensure that you have access to the following items:

- Keyboard and video monitor for First Boot of the Dell Acceleration Appliance for Databases
- IP address assignments, if static IP addresses will be used
- IP default gateway setting
- SSL certificate for remote access. A pre-configured SSL certificate is provided, but it will trigger security warnings; therefore, Dell recommends that you use your own SSL certificate.

To install the Dell Acceleration Appliance for Databases software on your target server, perform the following steps:

NOTE: To navigate through the installation screens, press Tab until your selection is highlighted, and then press Enter. Or, you can press **Alt+<highlighted letter>**, such as **Alt+H** for Help, or **Alt+N** for Next. Press the down arrow key to scroll through a list.

- 1 From the customer support site download the ISO image for the DAAD software.
- 2 Burn an installation DVD that contains the .ISO image. You can also softmount the ISO image through iDRAC or you can configure it on a bootable USB.

3 Power on the DAAD and boot the machine with the ISO image. The install screen is displayed:



- 4 Select Install ION Accelerator.
- 5 If you have multiple disks in the appliance, select the disk where the Dell Acceleration Appliance for Databases software will be installed, such as /dev/sda.
- 6 When the following warning prompt is displayed, select **Yes**:

Destroying ALL data on /dev/sda, continue ?
(Vas) (No)

A progress dialog box is displayed, first for loading the software and then for verifying the /dev/sda section on the boot disk.

DAAD detects the drives available in the IF100 and displays a dialog box asking you to confirm deletion of data on the drives.

Would you	like to	o keep exi	isting da	ata?			200
		< Yes >		< No	>		

7 To remove the previous data from all the drives, select No.

8 Confirm that you want to delete data by selecting Yes.

After DAAD software is installed, the software scans for existing network cards and displays detected controllers:

Olat Tuna Ilan Jan	Device Medel
Slot lype Vendor	Device nodel
0 Ethernet Broadcom Corporation	NetXtreme BCM5720 Gigabit Ethernet PCIe
9 Ethernet Broadcom Corporation	NetXtreme BCM5720 Gigabit Ethernet PCIe
0 Ethernet Broadcom Corporation	NetXtreme BCM5720 Gigabit Ethernet PCIe
0 Ethernet Broadcom Corporation	NetXtreme BCM5720 Gigabit Ethernet PCIe
1 Ethernet Mellanox Technologies	MT27500 Familu [ConnectX-3]
Humber of Network controllers: 0 Number of Ethernet controllers: 5 Number of Fibre Channel controllers: 0	
augi hay alagi nai ta ta 4 - anato (10262/68)	<u>< 0</u> K →

9 Select **OK** to proceed.

The Storage Protocol Selection dialog box is displayed showing the detected protocol as the default selection.

		-	
1	Fibre Ch	annel	1000
2	SRP over	InfiniBand	
	ISCSI		
			200.0
			21 E
	011 1		-
< r >	UK >	(Lance1)	NE -

10 Select **iSCSI** or **Fibre Channel** and then select **OK**.

The High Availability dialog box is displayed, showing a default selection determined by whether HA hardware was detected:

High A	wailab	ilit	y		
			1	Enable Disable	
	,	nν		/Canad N	-

11 Select **Disable** and then select **OK**.

The ION Configuration Summary dialog box is displayed, with a summary of the selected protocol and mode (HA or standalone)..



12 Select **Yes** to proceed with the Dell Acceleration Appliance for Databases configuration.

After DAAD completes configuration it will display the Network Configuration screen.

Accepting the license agreement

When you boot DAAD for the first time, a number of start-up messages are displayed. However, the first screen that requires user input is the End-User License Agreement (EULA) screen. When the EULA is displayed, read the agreement and accept it.

NOTE: To navigate through the installation screens, press Tab until your selection is highlighted, and then press Enter. Or, you can press Alt+<highlighted letter>, such as **Alt+H** for help, or **Alt+N** for Next. Press the down arrow key to scroll through a list.

- 1 Check **Yes** at the bottom of the screen to accept the agreement.
- 2 Select **Next** to continue.

YaST2 - firstboot 0 ion-	YaST2 - firstboot @ ion-54hunvuz			
License Agreement				
Language English (US)∎↓				
Dell End User Licens THIS END USER LICENS BETWEEN YOU (EITHER A PRODUCTS L.P., A TEX (SINGAPORE BRANCH), INCORPORATED IN THE I OF ITSELF, DELL INC. SUBSIDIARIES (COLLEC SOFTWARE ("SOFTWARE" HOTFIXES, MODULES, R VERSIONS OF THE SOFT SOFTWARE (COLLECTIVE PRINTED MATERIALS, O DISTRIBUTED BY OR ON LICENSE AGREEMENT BE THE SOFTWARE OR UPDA AGREEMENT THEN THIS SUCH UPDATES WILL BE THIS EULA. THE "SOFT PROGRAM AND UPDATES I ITSELF, DOES NOT ENT FUTURE. BY EXPRESSLY INSTALLING, ACTIVATII ARE AGREEING THAT YO WITH AND ARE BOUND B ALL APPLICABLE LAWS (BOUND BY THE TERMS A	e Agreement E AGREEMENT ("EULA") IS A LEGAL AGR AN INDIUDUAL OR AN ENTITY) AND DEL AS LIMITED PARTNERSHIP, OR DELL GLO THE SINGAPORE BRANCH OF A COMPANY NETHERLANDS WITH LIMITED LIABILITY AND DELL INC.'S DIRECT AND INDIREC TIVELY, "DELL"). THIS AGREEMENT GOU) AND ANY UPGRADES, UPDATES, PATCHE DUTINES, FEATURE ENHANCEMENTS AND A WARE THAT REPLACE OR SUPPLEMENT THE LY "UPDATES") AND THEIR ASSOCIATED IN LINE OR ELECTRONIC DOCUMENTATION, BEHALF OF DELL UNLESS THERE IS A S TWEEN YOU AND THE MANUFACTURER OR O CONSIDERED SOFTWARE FOR ALL PURPOS WARE" SHALL MEAN COLLECTIVELY THE ACCEPTING THESE TERMS OR BY DOWNLONG NA ANY COFIES THERED SING THE SOFTW J HAVE READ, AND THAT YOU AGREE TO Y THE TERMS AND CONDITIONS OF THIS AND REGULATIONS. IF YOU DO NOT AGRE ND CONDITIONS OF THIS EULA, THEN YO HAL REGULATIONS OF THIS EULA, THEN YO NG AND REGULATIONS OF THIS EULA, THEN YO NG CONDITIONS OF THIS EULA, THEN YO NG CONDITIONS OF THIS EULA, THEN YO NG AND REGULATIONS. IF YOU DO NOT AGRE ND CONDITIONS OF THIS EULA, THEN YO NG AND REGULATIONS OF THIS EULA, THEN YO NG CONDITIONS OF THIS EULA, THEN YO CONSIDERED ADFORMENT ON THIS YOU AND THE YOU TO ANY HENCE YOU YOU AND THE YOU YOU AND THEN ACCEPTING THESE STARTS OF THIS YOU HAVE READ, AND THAT YOU AGREE TO YOU Y THE TERMS AND CONDITIONS OF THIS AND REGULATIONS. IF YOU DO NOT AGRE ND CONDITIONS OF THIS EULA, THEN YO ND CONDITIONS OF THIS EULA, THEN YO ND CONDITIONS OF THIS YOU AND YOU AGREE ND CONDITIONS OF THIS YOU AND YOU AGREE ND CONDITIONS OF THIS YOU AND YOU AGREE ND CONDITIONS OF THIS YOU AND YOU AGREE ADD AND AND YOU AND THAT YOU AGREE ADD AND YOU AND YOU AND THIS YOU AND YOU AGREE ND CONDITIONS OF THIS YOU AND YOU AND YOU AGREE ND CONDITIONS OF THIS YOU AND YOU AND YOU AGREE ND YOU AND YO	EEMENT L BAL B.V. ON BEHALF T ERNS ALL S, DDITIONAL ORIGINAL MEDIA, EPARATE WMER OF ES, AND ES OF OF UPTWARE IN AND OF IN THE ADING, ARE, YOU COMPLY EULA AND E TO BE U MAY NOT		
() No, I Do Not Agre	B			
[ielp]	[Back]	[Abort]	[Next]	
F1 Help F9 Abort				

Configuring networking

After accepting the EULA, the Network Configuration screen displays the Ethernet adapters that are installed in your system. By using Table 2-1, determine the section of this guide to use to configure DAAD networking.

Table 2-1. DAAD configuration sections



For a standalone Fibre Channel configuration, configure one of the built-in Ethernet ports for console access into the DAAD. Instructions about this task are available at Configuring standalone FC and IB on page 25.



Table 2-1. DAAD configuration sections (Continued)

For an HA Fibre Channel configuration, configure one of the built-in Ethernet ports for console access into the DAAD and configure the cluster connection between your two DAAD systems. Instructions about this task are available at Configuring FC and IB for HA on page 73

NOTE: In this configuration, the ConnectX-3 entries represent two ports on the same card. It does not represent two cards.





For a standalone iSCSI configuration, configure one of the built-in Ethernet ports for console access into the DAAD and then configure the ConnectX-3 iSCSI interfaces. Instructions about this task are available at Configuring standalone iSCSI on page 37

NOTE: In this configuration, the ConnectX-3 entries represent four ports on two different cards

Slots 1-3 Network Configuration Screen YaST2 - firstboot @ ion-54hunvuz Network Configuration () Skip Configuration 1 iSCSI HA (Eth) 4 LSI SAS HB (x) Use Following Configuration 2 LSI SAS HB/ iSCSI 5 iscsi Network Interfaces 3 HA (Eth) iSCSI NetXtreme BCM5720 Gigabit Ethernet PCIe × Not configured yet. NetXtreme BCM5720 Gigabit Ethernet PCIe × Not configured yet. Ethernet Network Card Not configured yet. NetXtreme BCM5720 Gigabit Ethernet PCIe Not configured yet. MT27500 Family [ConnectX-3] Not configured yet. MT27500 Family [ConnectX-3] × Not configured yet. MT27500 Family [ConnectX-3] ¥ Not configured yet. MT27500 Family [ConnectX-3] Not configured yet. MT27500 Family [ConnectX-3] × Not configured yet. MT27500 Family [ConnectX-3] Not configured yet.

Table 2-1. DAAD configuration sections (Continued)

For an HA iSCSI configuration, configure the following:

- One of the built-in Ethernet ports for console access into the DAAD
- Four ConnectX-3 iSCSI interfaces
- Two ConnectX-3 ports for the HA cluster connection between your two DAAD systems.

Instructions about this task are available at Configuring iSCSI for HA on page 53

NOTE: In this configuration, the ConnectX-3 entries represent six ports on three different cards. Do not configure two ports on the same card for the HA cluster connection.





For a standalone InfiniBand configuration, configure one of the built-in Ethernet ports for console access into the DAAD. Instructions about this task are available at Configuring standalone FC and IB on page 25.

Table 2-1. DAAD configuration sections (Continued)



Configuring standalone FC and IB

The steps for configuring a standalone fibre channel DAAD system and a standalone InfiniBand/SRP DAAD system are the same. To configure either your standalone fibre channel or standalone InfiniBand/SRP DAAD system, perform the following steps:

- Configure the management port
- Set the Hostname and Routing information for DAAD
- Set the Time Zone and NTP settings
- Set the admin user password
- Finish the configuration

Configuring the management port

The management port is one you have connected by an external cable to your network and is externally visible. This port must be configured so your network hardware communicates with the Dell Acceleration Appliance for Databases.

To configure the management port:

1 On the Network Configuration screen, select **Change** (bottom of the screen) and then **Network Interfaces**.



The Network Settings screen is displayed with the detected network adapters listed.

2 Select the management IP card from the list.

Ya	ST2 - firstboot @ ion-ofq05x8h			
N	etwork Settings Overview—Hostname/DNS—Routing————			
	Name	IP Address	Device	Note
	NetXtreme BCM5720 Gigabit Ethernet PCIe NetXtreme BCM5720 Gigabit Ethernet PCIe	Not configured Not configured		
	Ethernet Network Card NetXtreme BCM5720 Gigabit Ethernet PCIe	DHCP Not configured	eth0	

3 Select **Edit** (in the lower-left corner of the screen). [Add][Edit][Delete]

The Network Card Setup screen is displayed.

[Add][Edit][Delete]		
Alias Name IP Address Netmask		
2.168.77.105 Iditional Addresses	255.255.255.0	
Statically assigned IP Address Address	Subnet Mask	
Dynamic Address DHCP	DHCP both version 4 and 6 4	
hernet No Link and IP Setur (Bonding S	↓ eth0	
rico igpo	oom igaraoion nano	

- 4 Select Statically assigned IP Address.
- 5 Enter the IP Address and Subnet Mask for your network.
- 6 Select Next.

Setting hostname and routing information

To configure Hostname and routing information:

- 1 On the Network Settings screen, press the right arrow key to select **Hostname**.
- 2 Tab to the Hostname field and enter the Hostname for the DAAD.
- 3 Tab to the Domain Name field and enter the Domain Name.

4 Tab to the Name Servers fields and enter up to three Name Servers.

Network Settings		
-Queruieu Hestrane (DNS Pouting		
Usefore and Densin News		
nostname and Domain name		
Hostname	Domain Name	
daad-ib-1	lab.local	
Name Servers and Domain Search List		
Name Servers and Donath Scarch List		
name server 1	ruomain search	
192.168.77.10	 A second state of the second stat	189.053 - 68. 51
Name Server 2		
News Service 2		
name server s		
이 지수는 것은 것은 것을 가지 않는 것을 가지 않는 것을 가지 않는 것을 수가 없다.		
. : : : : : : : : : : : : : : : : : : :		
김 영상은 가장 있는 것은 것은 것은 것이 없는 것이 없다.		
승규는 소전 같은 것은 것에서 있는 것을 많이 것을 같아.		
이 같은 것은 것은 것은 것은 것은 것을 가지 않는 것은 것을 가지 않는다. 같은 것은		
· 전에 비해해 관람이 가지? 아이는 이 것은 것이 있는 것이 하는 것이 ?		
유명화 같은 전 전 관람이 있는 것 같은 것 같		
Help] [Back	[Cancel]	E OK 3
M John RO Canadi RIO OV		

- 5 Press Tab until the focus is back on the Overview line.
- 6 Press the right arrow key to select Routing.

YaST2 –	firstboot 0 ion-c	of q05x8h		
Networl	k Settings			
[Overv	iew—Hostname/DNS-	-Routing		
				 Buddalogi (1998) (1998)
	Default Gateway 192 168 77 1			1
	[Routing Table			
	Destination	way Netmask Device Ontions		
		Eppel	Edit][Delete]	
[Help]		[Back]	[Cance]]	L OK 1
1				and the second se

7 Tab to the Default Gateway field and enter the Default Gateway.

8 Select OK.

The Saving Network Configuration Screen is displayed.



Setting time zone and NTP settings

To set Time Zone and NTP:

1 Tab to the Region field and use the arrow keys to select the region where the DAAD will be located.

14312 -	Therefore a non-orgonean				
Clock a	and Time Zone				
Reg	ion		-Time Zone		_
Afr	ica		Alaska (Anchorage)		
Arge	entina		Aleutian (Adak)		
Asia	a bile for the broken of the bile bile bile bile bile bile bile bil		Arizona (Phoenix)		
Atla	antic	 A data and so that the set 	Boise		
Aust	tralia		Central (Chicago)		
Braz	zil		East Indiana (Indianapolis)		
Cana	ada a di kana d		Eastern (New York)		
Cent	tral and South America		Hawaii (Homolulu)		
Etc			Indiana (Marengo)		
Euro	ope		Indiana (Petersburg)		
Glo	bal		Indiana (Tell Citu)		
Ind	ian Ocean		Indiana (Vevau)		
Mex	ico		Indiana (Vincennes)		1.1
Pac	ific		Indiana (Winamac)		
Russ	sia		Indiana Starke (Knox)		
USA			Juneau		
			Kentucky (Louisville)		
			Kentucky (Monticello)		
			Menominee		
			Michigan (Detroit)		
			Mountain (Denver)		
			None		
		김 아파 중에 가지 않는 것이 같이 봐.	North Dakota (Center)		
			North Dakota (New Salem)		
			Pacific (Los Angeles)		
			Puerto Rico		
			Samoa (Pago Pago)		
			Shiprock		
			Virgin Islands (St Thomas)		
			Yakutat		
			Date and Time (NTP is configured)		_
[x]	Hardware Clock Set To UTC		2015-02-24 - 16:23:50		
				[Change	1
[Help]		[Back]	[Abort]	[]	lext]
INC. Inclusion	TO DE LE TO ALL C. DAO M. C.				

2 Tab to the Time Zone field and select the zone where the DAAD will be located.



3 Tab to the Date and Time field and select **Change**. The Change Date and Time screen is displayed.

CAUTION! If you are using an HA configuration you must configure DAAD to synchronize with NTP.

- 4 Tab to the Synchronize with NTP Server field and select it.
- 5 Tab to the NTP Server Address field and enter the address of the NTP server to synchronize with.
- 6 Tab to the Save NTP Configuration field and select it.

7 Tab to the Configure field and select it.

The Advanced NTP Configuration screen is displayed.

YaST2 - timezone @ c1node1		
Advanced NTP Configuration	ettings	
Start NTP Daemon () Only Manually (x) Now and On Boot		
Runtime Configuration Policy Auto	yCustom Policy v	
Synchronization Type Addres Server 2.ope	ss nsuse.pool.ntp.org	
[Add][Edit][Delete]	<u>[</u>	Display Log]
[Help]	[Cancel]	[OK]
F1 Help F3 Add F4 Edit F5 D	elete F9 Cance instantiat @. 2014 Fundament	-lo Comhenial 8

- 8 Select **Delete** to delete the default NTP configuration.
- 9 Select **Add** to add a new configuration.
- 10 In the New Synchronization screen that is displayed, select **Server**.

YaST2 - timezone	@ c1node1		
New Synchronizat	ion.		
((X) Server		
	() R <mark>a</mark> dio Clock		
	() Outgoing Broadcast		
	() Incoming Broadcast		
[Help]	[Back]	[Abort]	[Next]
F1 Help F8 Back	F9 Abort F10 Next		

11 Select Next.

YaST2 - timezone	@ c1node1		
NTP Server	Server Settings ddress vour new server IP Options iburst Access Control Optio	st]	
[Help] F1 Help F8 Back	[Back] F9 Abort F10 <mark>OK</mark>	[Abort]	[ОК]

12 In the NTP Server screen that is displayed, tab to select the Address field.

- 13 Type the NTP server address.
- 14 Select OK.
- 15 If you have additional NTP servers, repeat steps 9-14 to configure them.
- 16 Select Accept to save the NTP changes and continue.

Setting the admin user password

To set the admin user password:

1 Type the Dell Acceleration Appliance for Databases password for the admin user.

NOTE: If the password you selected is not sufficiently strong, a warning message is displayed so you can change the password, if necessary.

2 Retype the password you entered.

CAUTION! Be sure to record this password in a secure location in case it needs to be retrieved.

3 To test the Keyboard Layout or use the Expert Options, select those options on the screen.

4 Select Next.

YaSTZ - firstboot @ ion-ofq05x8h			
Password for the GUIZINCAL System Adv	inistrator "admin"		
가 가 가 가 있는 것이 가 있는 것이 가 있는 것이 가 있었다. 이 가 하나 것이 있는 것이 있다. 한 바이가 한 것은 것은 것을 하는 것이 있는 것이 가 있는 것이 있다. 것이 같은 것이 같이 있는 것이 같이 있는 것이 같이 있다. 같이 있는 것이 같이 있는 것이 같이 있는 것이 같이 있는 것이 있			
· · · · · · · · · · · · · · · · · · ·			
그는 데는 것은 것은 것을 하려려면 소설을 했다.	Do not forget the password.		
이 집 것 같은 것은 것이 같은 것이 같이 같이 같이 같이 했다.	If you decide to change it lat	er, TI	
	Password		

	Confirm Password		

	Test Keyboard Layout		
	[Expert Options]		
이렇게 다 여행을 다 가지 않는 것 같아. 한 것 같아.			
지 방법에서 알고 있는 것 같아요. 한 것 않는 것 같아요.			
· · · · · · · · · · · · · · · · · · ·			
[Help]	[Back]	[Abort]	[lext]

If you want to change this password later, change the admin user and GUI passwords separately. For more information, see Changing Passwords in the *Dell Acceleration Appliance for Databases GUI Guide*.

Completing the DAAD configuration

After the configuration phases are complete, the Configuration Completed screen is displayed.

To complete DAAD configuration:

YaST2 - firstboot 0 ion-ofq05x8h Configuration Completed Congratulations! The system configuration of the ION Accelerator is complete. After clicking Finish, follow the instructions on the console screen. Visit us at www.sandisk.com.	1	Select Finish .	
Configuration Completed Congratulations! The system configuration of the ION Accelerator is complete. After clicking Finish, follow the instructions on the console screen. Visit us at www.sandisk.com.	YaS	ST2 - firstboot @ ion-ofq05x8h	
Congratulations! The system configuration of the ION Accelerator is complete. After clicking Finish, follow the instructions on the console screen. Visit us at www.sandisk.com.	Co	onfiguration Completed	
The system configuration of the ION Accelerator is complete. After clicking Finish, follow the instructions on the console screen. Visit us at www.sandisk.com.		Congratulations!	
Visit us at www.sandisk.com.		The system configuration of the ION Accelerator is complete. After clicking Finish, follow the instructions on the console screen.	
		Visit us at www.sandisk.com.	
[Help] [Back] [Abort] [Pinish]	E He	Help] [Back] [Abort] [Finish]

The DAAD system restarts and displays start-up messages. After a login prompt is displayed on the console, you can connect to DAAD for additional setup and configuration. An example screenshot is given here:

Stanting Sustans Management Nata Engine	
Starting Jostews nanogement bata Engine.	done
Starting dam _s_ eventument.	done
Starting use sa coentegra.	aone
Starting dsm_sa_snmpd: pldof: can't get program name from /proc/31175/stat	
	done
Starting DSM SA Shared Services:	done
에는 것에서 제공하게 있는 것에서 이상에서 가지 않는 것이 있는 것이 같이 있는 것이 없는 것이 있는 것이 있는 것이 없는 것이 같이 없는 것이 없 것이 없는 것이 없다. 것이 없는 것이 없다. 것이 없는 것이 없 않이 없다. 것이 없는 것이 없다. 것이 없는 것이 없다. 것이 없 않은 것이 없는 것이 없는 것이 있 않이 않이 않이 않이 않는 것이 없다. 것이 없는 것이 없다. 것이 없는 것이 없는 것이 없는 것이 없는 것이 없다. 것이 않은 것이 않이	
Load SRP over InfiniBand protocol stack	
Load ioMemory VSL	
Setting noop scheduler for fioa fiob fioc fiod	
Start all md	
Loading and configuring the mid-level SCSI target SCST	done
Starting fin-saft:	done
Shutting down sfcb:	done
Stanting cfor	done
Junifu Studie and an and the state of the st	uone
verify the passea, proceeding with startup	
starting upenHis/Corosync daemon (corosync): starting UK	
Set rel_tgt_1d on each target	
Set rel_tgt_id on target fe80:0000:0000:0000:f452:1403:0038:3af1	
Set rel_tgt_id on target fe80:0000:0000:0000:f452:1403:0038:3af2	
Set rel_tgt_id om target fe80:0000:0000:0000:f452:1403:0038:3f21	
Set rel tgt id on target fe80:0000:0000:0000:f452:1403:0038:3c71	
Enabling target ib srpt fe80:0000:0000:0000:f452:1403:0038:3af1	
Enabling target ib spot fe80:0000:0000:0000:f452:1403:0038:3af2	
Enabling target ib sput fe80:0000:0000:6452:1403:0038:3f21	
Frankling tanget in some fass and and and and an an and an and an and an and an and an and an an and an	
	dono
Starting Simple	done
Starting flo-snmp-agentx: UK	aone
Starting flo-MSrv: UK	done
Starting fio-agent: UK	done
Starting ion:	done
Master Resource Control: runlevel 3 has been	reached
akakin dina kata kanakin kata kata kata kata kata kata kata kat	
Copyright (c) 2015 SanDisk Corp. and/or all its affiliates. All rights reserved.	
WARNING: This is a private system. Do not attempt to login unless you are an	
authorized user. Any authorized or unauthorized access or use may be monitored	
and can result in criminal or civil prosecution under applicable law.	
Welcome to SanDisk ION Accelerator 2.5.1-364	
System Serial Number: "CBGP842"	
To further administer go to:	
https://192.168.77.111	
daad-ib-1 login:	
dada 10 1 rogin.	
4

Configuring standalone iSCSI

To configure your standalone iSCSI DAAD system, perform the following steps:

- Configure the management port
- Set the Hostname and Routing information for DAAD
- Set the Time Zone and NTP settings
- Set the admin user password
- Finish the configuration

Configuring the management port

The management port is one you have connected by an external cable to your network and is externally visible. This port must be configured so your network hardware communicates with the Dell Acceleration Appliance for Databases.

To configure the management port:

1 On the Network Configuration screen, select **Change** (bottom of the screen) and then **Network Interfaces**.

[Back]	Network Interfaces Reset to defaults	ort]	[Next]

The Network Settings screen is displayed with the detected network adapters listed.

TZ - firstboot 0 in	m-of a05x8h			
twork Settings verview—Hostname∕I	NS-Routing			
M		ITR ATTACA	Incode	DAL2.1
Name NotVinena BCME720 C	igshit Ethonnot PCL	IP Address	Device	Note
Name NetXtreme BCM5720 G	igabit Ethernet PCI	IP Address Not configured	Device	Note
Name NetXtreme BCM5720 G NetXtreme BCM5720 G	ligabit Ethernet PCI ligabit Ethernet PCI	IP Address Not configured Not configured	Device	Note
Name NetXtreme BCM5720 G NetXtreme BCM5720 G Ethernet Network Ca	Aigabit Ethernet PCI Aigabit Ethernet PCI rd	IP Address Not configured Not configured DHCP	Device eth0	Note

3 Select **Edit** (in the lower-left corner of the screen). [Add][Edit][Delete]

The Network Card Setup screen is displayed.

twork Card Setup			
Device Type	Configuration Na	Ime	
Ethernet	↓ eth0		
) No Link and IP Setup (Bonding S	laves) [] Use iBFT values		
) Dynamic Address			
JHCP J	DHCP both version 4 and b		
O Statically assigned in Hadress	Subnet Mask		
02.168.77.105	255,255,255,0		
Additional Addresses			
Alias Name IP Address Netmask			
그는 영영은 눈 전망 것이 전망을 가장 감독했다.			
			and a training of the second
[Add][Edit][Delete]			
	[Pack]	[Cancel]	ΓN.

- 4 Select Statically assigned IP Address.
- 5 Enter the IP Address and Subnet Mask for your network.
- 6 Select Next.

Configuring ConnectX-3 ports for iSCSI

To configure ConnectX-3 ports for iSCSI:

1 On the Network Configuration screen, select **Change** (bottom of the screen) and then **Network Interfaces**.

[Back] Network Interfaces Reset to defaults ort] [Next				
	[Back]	Network Interfaces Reset to defaults	ort]	[Next]

The Network Settings screen is displayed with the detected network adapters listed.

2 Select an unconfigured ConnectX-3 port from the list.

tXtreme BCM5720 Gigabit Ethernet PCIeNot configuredhernet Network Card10.60.35.41eth0tXtreme BCM5720 Gigabit Ethernet PCIeNot configuredeth427500 Family [ConnectX-3]Not configuredeth527500 Family [ConnectX-3]Not configuredeth627500 Family [ConnectX-3]Not configuredeth627500 Family [ConnectX-3]Not configuredeth6	tXtreme BCM5720 Gigabit Ethernet PCIe hernet Network Card tXtreme BCM5720 Gigabit Ethernet PCIe	Not configured 10.60.35.41		
ResultNot configuredeth4ResultNot configuredeth5ResultNot configuredeth5ResultNot configuredeth6ResultNot configuredeth6ResultNot configuredeth7		Not configured	eth0	
27500 Family [ConnectX-3] Not configured eth5 27500 Family [ConnectX-3] Not configured eth6 27500 Family [ConnectX-3] Not configured eth7	27500 Family [ConnectX-3]	Not configured	eth4	
Provide Family LConnectX-31 Not configured ethb Provide Family LConnectX-31 Not configured eth7	7500 Family [ConnectX-3]	Not configured	eth5	
	27500 Family LConnectX-3J 27500 Family [ConnectX-3]	Not configured Not configured	eth6 eth7	

3 Select **Edit** (in the lower-left corner of the screen). [Add][Edit][Delete]

The Network Card Setup screen is displayed.

Device Type	Conf igur	ation Name	
Ethernet	↓ eth8		
) No Link and IP Setu) Dupamic Address	p (Bonding Slaves) L J Use iBFT val		
DHCP	↓ DHCP both version 4 an	16∭∔	
) Statically assigned	IP Address		
' Address	Subnet Mask		
Additional Addresses—			
	Network		
HIIAS NAME IF HAAF	essinetnask		
[Add][Edit][Delete]			
-1	[Rack]	[Cance]]	г

4 Select Statically assigned IP Address.

Each iSCSI port must be configured on its own subnet. Also, it is a best practice to have the last octet of the IP address match the last octet of the host.

For example, with a host IP address of 100.128.10.41, you might configure the iSCSI ports for the following subnets:

- 192.168.**20**.41
- 192.168.**21**.41
- 192.168.22.41
- 192.168.23.41

Here is an example of unique subnet numbering for iSCSI ports in the user interface:

ame .		IP A	ddress	Device	Note
NetXtreme BCM5720 Gigabit Ethernet	PCIe	Not	conf igured		
letXtreme BCM5720 Gigabit Ethernet	PCIe	Not	conf igured		
Ethernet Network Card		100.	168.20.41	eth0 👘	
NetXtreme BCM5720 Gigabit Ethernet	PCIe	Not	conf igured		
MT27500 Family [ConnectX-3]		192.	168.20.41	eth4	
MT27500 Family [ConnectX-3]		192.	168.21.41	eth5	
MT27500 Family [ConnectX-3]		192.	168.22.41	eth6	
MT27500 Family [ConnectX-3]		192.	168.23.41	eth?	

5 Enter the IP Address and Subnet Mask for your network.

512 - TIPStboot @ 108-3	4nunouz		
twork Card Setup			
ieneral— <mark>Address</mark> —Ha r dw	are		
Device Type	Conf igura	tion Name	
Ethernet	4 eth8		
) No Link and IP Setu	p (Bonding Slaves) [] Use iBFT valu		
J Dynamic Address		∠∰1	
	J DHUP BOTH VERSION 4 and	b∭t	
x) statically assigned	IF Haaress		
92 168 22 41			
Additional Addresses	761		
Alias NamelIP Addr	ess Netmask		
[Add][Edit][Delete]			

- 6 Select Next.
- 7 On the Network Card Setup screen, press left-arrows to select General.
- 8 Tab to the Set MTU field.
- 9 Set MTU to **9000**.

NOTE: Ensure that the switches and routers on your network are configured to correctly handle this MTU size.

- 10 Select Next.
- 11 Repeat steps 2-10 until all four iSCSI ports are configured.

Setting hostname and routing information

To configure Hostname and routing information:

- 1 On the Network Settings screen, press the right arrow key to select **Hostname**.
- 2 Tab to the Hostname field and enter the Hostname for the DAAD.

- 3 Tab to the Domain Name field and enter the Domain Name.
- 4 Tab to the Name Servers fields and enter up to three Name Servers.

	[Back]	[Cancel]	1 02 1
Name Server 3			
Name Servers and Domain Search List- Name Server 1 192.168.77.10 Name Server 2		rDomain Search	
Network Settings Tourryiew-Hostname/DNSRouting Hostname and Domain Name	I Statistics and statistics and statistics	Dona in Name Lab. loca l	

- 5 Press Tab until the focus is back on the Overview line.
- 6 Press the right arrow key to select Routing.

YaST2	firstboot @ ion-ofq05x8h		
Netuo	k Settings		
[Over	iew—Hostname/DNS— Routing ————		_
	Default Gateway		
	192.168.77.1		
	Routing Table		
	Destination Gateway Netmask Device Options	3	
			Contra Contra
		· · · · · · · · · · · · · · · · · · ·	en sakatuk je je Konsta
		[Add][Edit][Delete]	
		n de la general participation de la construction de la construction de la construction de la construction de la Anna a la construction de la constru	
[Help]	[Back]	[Cancel]	OK 1

7 Tab to the Default Gateway field and enter the Default Gateway.

8 Select **OK**.

The Saving Network Configuration Screen is displayed.



Setting time zone and NTP settings

To set Time Zone and NTP:

1 Tab to the Region field and use the arrow keys to select the region where the DAAD will be located.

	похор		
Clock and Time Zone			
Region		Time Zone	
Africa		Alaska (Anchorage)	
Argentina		Aleutian (Adak)	
Asia		Arizona (Phoenix)	
Htlantic		Boise	
Hustralla		Central (Chicago)	
Brazil		East Indiana (Indianapolis)	
Canada		Lastern (New York)	
Central and South Hme	rica	Hawall (Honolulu)	
EUC		Indiana (Patenshung)	
Lurope		Indiana (retersburg)	
GIODAI Indian Orașe		Indiana (leff City)	
Maxico		Indiana (Uinconnoc)	
nex1co		Indiana (Vincennes)	
Pacifi 10		Indiana (Winamac)	
RUSSId		Thalana Starke (MOX)	
uan		Ventuelau (Leuieuille)	
		Kentucky (Louisville)	
		Monominoo	
		Michigan (Defacit)	
		Mountain (Denuen)	
		None	
		Nonth Dakota (Center)	
		North Dakota (New Salem)	
		Pacific (Los Angeles)	
		Puento Pico	
		Pares (Pare Pare)	
		Sallua (Tayu Tayu)	
		Ulingin Johnson (St. Thense)	
		VIPUTATA ISTATION (ST TRUMAS)	
		Yakutat	
		그는 방법 사람은 동안에 가지 않는 것을 것을 가지?	
		이 집에 가지 않는 것은 것은 것은 것은 것을 많이 많이 했다.	
		방법 김 사람이 많은 것이 있는 것을 많이 많이 많다.	
승규는 분석으로 가지 않는 것 같아.			
		Data and Time (NTD is santismed)	
[] U	T- 1170	pate and lime (MIP is configured)	
LXI Hardware Clock Set		2015-02-24 - 16:23:50	
			IChangeI
[Help]	[Pack]	[About]	[Nevt1
rue pi	LBACKI	LINDIAL	Inext1
	P10 Novt		

2 Tab to the Time Zone field and select the zone where the DAAD will be located.



3 Tab to the Date and Time field and select **Change**. The Change Date and Time screen is displayed.

CAUTION! If you are using an HA configuration you must configure DAAD to synchronize with NTP.

- 4 Tab to the Synchronize with NTP Server field and select it.
- 5 Tab to the NTP Server Address field and enter the address of the NTP server to synchronize with.
- 6 Tab to the Save NTP Configuration field and select it.

7 Tab to the Configure field and select it.

The Advanced NTP Configuration screen is displayed.

YaST2 - timezone @ c1node1		
Advanced NTP Configuratio	<mark>n</mark> ty Settings	
Start NTP Daemon () Only Manually (x) Now and On Boot		
Runtime Configuration P Auto	olicyCustom Policy v	
Synchronization Type A Server 2	ddress .opensuse.pool.ntp.org	
[Add][Edit][Delewe])	[Display Log]
[Help]	[Cancel]	[OK]
F1 Help F3 Add F4 Edit	F5 Delete F9 Cancelmontel@.201	Fusion-lo Confidential 8

- 8 Select **Delete** to delete the default NTP configuration.
- 9 Select **Add** to add a new configuration.
- 10 In the New Synchronization screen that is displayed, select **Server**.

YaST2 - timezone	@ clnode1		
New Synchronizat	ion		
	Туре		
((x) Server		
	() R <mark>a</mark> dio Clock		
	() Outgoing Broadcast	:	
	() Incoming Broadcast	:	
[Help]	[Back]	[Abort]	[Next]
F1 Help F8 Back	F9 Abort F10 Next		

11 Select Next.

	ver sereen that is display	yea, tab to select the Addre	55 Held.
YaST2 - timezone	@ clnodel		
NTP Server	Server Settings ddress vour new server IP Options iburst Access Control Option	[Selectv] it]	
[Help] F1 Help F8 Back	[Back] F9 Abort F10 OK	[Abort]	[OK]

12 In the NTP Server screen that is displayed, tab to select the Address field.

- 13 Type the NTP server address.
- 14 Select OK.
- 15 If you have additional NTP servers, repeat steps 9-14 to configure them.
- 16 Select **Accept** to save the NTP changes and continue.

Setting the admin user password

To set the admin user password:

1 Type the Dell Acceleration Appliance for Databases password for the admin user.

NOTE: If the password you selected is not sufficiently strong, a warning message is displayed so you can change the password, if necessary.

2 Retype the password you entered.

CAUTION! Be sure to record this password in a secure location in case it needs to be retrieved.

3 To test the Keyboard Layout or use the Expert Options, select those options on the screen.

4 Select Next.

YaSTZ – firstboot @ ion-ofqU5x8h			
Passuond for the GUI/IDCAL Sustem Adm	inistrator "admin"		
이가 가지 않는 것이 있는 것이가 가지 않는 것이다. 이가 있는 것이다. 이 가지 않는 것이 말했는 것이 같아요. 이가 같아요. 같이 있는 것이 같이			
이상 같은 것은 것은 것을 가려면서 같은 것을 수요.	Do not forget the password.		
	If you decide to change it lat	er,	
	Password		
이 별 봐야 봐야 한 것은 것을 수 없어. 한 것	*****		
. 전문법(1996년) 전문법 등 전문법 등 보이 등 등			
	Cont Irm Password		
이 같은 것은 것은 것과 방법을 하는 것이다.			
	Test Keyboard Layout		
	[Expert Options]		
- 2月時間は路底に住していた。 パンパイト・ション			
· 사람은 다 가 안에서 물건 것 같아. 가지가 있는 것 같아. 가지가 다 가지가 다 가지가 다 가지가 다 가지 않는 것이다. 이 가지 않는 것이 같이 같이 가지 않는 것이 같이			
· · · · · · · · · · · · · · · · · · ·			
[Help]	[Back]	[Abort]	[Next]

If you want to change this password later, change the admin user and GUI passwords separately. For more information, see Changing Passwords in the *Dell Acceleration Appliance for Databases GUI Guide*.

Completing the DAAD configuration

After the configuration phases are complete, the Configuration Completed screen is displayed.

To complete DAAD configuration:

1 Select Finish.
YaST2 - firstboot @ ion-ofq05x8h
Configuration Completed
Congratulations!
The system configuration of the ION Accelerator is complete. After clicking Finish, follow the instructions on the console screen.
Visit us at www.sandisk.com.
[Help] [Back] [Abort] [Pinish]
F1 Help F9 Abort F10 Finish

The DAAD system restarts and displays start-up messages. After a login prompt is displayed on the console, you can connect to DAAD for additional setup and configuration. An example screenshot is given here:

Starting Sustems Management Data Engine	
Starting den sa datamard:	done
Starting dsm sa eventmgrd:	done
Starting dsm_sa_snmpd: pidof: can't get program name from /proc/31175/stat	
Starting DSM SA Shared Services:	done done
Load SRP over InfiniBand protocol stack Load ioMemory VSL	
Setting noop scheduler for fioa fiob fioc fiod Start all md	
Loading and configuring the mid-level SCSI target SCST	done
Starting fio-saft:	done
Shutting down sfcb:	done
Starting sfcb:	done
Verify FRU passed: proceeding with startup	
Starting UpenAIS/Corosync daemon (corosync): starting UK	
Set rel tyt la on target Set rel tyt la on target 6990-0000-0000-0000-0452-1402-0029-2-51	
Set rel_tyt_id om target fe80.0000.0000.0000.01522.1403.0030.301	
Set rel_tyt_id on target fe80.0000.0000.0000.132.1403.0038.3f21	
Set rel_yt_id on target fe80.0000.0000.0000.132.1403.0038.3c71	
Evabling farget ib strifter 10000.0000.0000.0000.0000.0000.00000000	
Enabling target ib spt fe88:0000:0000:0000:f452:1403:0038:3af2	
Enabling target ib srpt fe80:0000:0000:0000:f452:1403:0038:3f21	
Enabling target ib_srpt fe80:0000:0000:0000:f452:1403:0038:3c71	
Starting snmpd	done
Starting fio-snmp-agentx: OK	done
Starting fio-msrv: OK	done
Starting fio-agent: OK	done
Starting ion:	done
Master Resource Control: runlevel 3 has been	reached
Copyright (c) 2015 SanDisk Corp. and/or all its affiliates. All rights reserved.	
WARNING: This is a private system. Do not attempt to login unless you are an authorized user. Any authorized or unauthorized access or use may be monitored and can result in criminal or civil prosecution under applicable law.	
Welcome to SanDisk ION Accelerator 2.5.1-364	
System Serial Number: "CBGP842"	
To further administer go to:	
https://192.168.77.111 daad-ib-1 login:	

Configuring iSCSI for HA

To configure your iSCSI DAAD system for HA, perform the following steps:

- Configure the management port
- Configure the two ConnectX-3 ports for HA
- Configure the remaining ConnectX-3 ports for iSCSI
- Set the Hostname and Routing information for DAAD
- Set the Time Zone and NTP settings
- Enable the Cluster Setup
- Set the admin user password
- Finish the configuration

NOTE: If you are planning to deploy DAAD in an HA configuration, ensure that both Infiniflash systems have the same number of Infiniflash drive cards in the same slots.

Configuring the management port

The management port is one you have connected by an external cable to your network and is externally visible. This port must be configured so your network hardware communicates with the Dell Acceleration Appliance for Databases.

To configure the management port:

1 On the Network Configuration screen, select **Change** (bottom of the screen) and then **Network Interfaces**.

[Back]	Network Interfaces Reset to defaults	ort]	[Next]

The Network Settings screen is displayed with the detected network adapters listed.

2 Select the management IP card from the list.

YaST2 - firstboot 0 ion-ofq05x8h	
Network Settings	
Overview Hostname/DNS—Routing	
Name	IP Address Dewice Note
NetXtreme BCM5720 Gigabit Ethernet PCIe	Not configured
NetXtreme BCM5720 Gigabit Ethernet PCIe	Not configured
Ethernet Network Card	DHCP eth0
NetXtreme BCM5720 Gigabit Ethernet PCIe	Not configured

3 Select **Edit** (in the lower-left corner of the screen). [Add][Edit][Delete]

The Network Card Setup screen is displayed.



4 Select Statically assigned IP Address.

- 5 Enter the IP Address and Subnet Mask for your network.
- 6 Select Next.

Configuring ConnectX-3 ports for HA

To configure the ConnectX-3 ports for HA:

1 Tab to select the first ConnectX-3 Ethernet HA port. This will be the second port (Port 2) in the card in slot 1 with a BusID of 0000:81:00.0.

```
M127500 Family (ConnectX+31)(Noteconnected) (connected)
MAC : f4:52:14:38:3f:22
BusID : 0000:81:00.0
Device Name: eth5
The device is not configured. Press Edit to configure.
```

- 2 Select Edit.
- 3 Tab until the IP Address field is selected.
- 4 Enter the IP Address for the port.

NOTE: Use the static IP addresses and subnet masks shown in the table here for the cluster interconnect ports. Using other IP addresses or subnet masks may lead to unexpected behavior.

	DAAD 1	DAAD 2
First HA Port	192.168. 1.1	192.168. 1.2
Second HA Port	192.168. 2.1	192.168. 2.2
Subnet Mask	255.255.255.0	255.255.255.0

5 Press Tab and enter **255.255.255.0** for the Subnet Mask.

YaST2 – firstboot @ ion-ofq05x8h	
Network Cand Setur	
General Address Hardware	
Device Type	Configuration Name
Ethernet	↓ eth5
() No Link and IP Setup (Bonding Slaves) [] Use iBFT values
() Dynamic Address	
DHCP 1 DHCP bo	th version 4 and 614
(x) Statically assigned IP Address	
192 168 0 1	
Additional Addresses	
Alias Name IP Address Netmask	
[4] [4] 이 이 이 이 이 이 이 이 이 이 이 이 이 이 이 이 이 이 이	
그는 것이 나는 것이 같아요. 것이 같은 것은 것이 같이 것이 같아.	
이 같은 방법에서 관계적으로 한것에 가격하는 것 같은 것을 가 있었다.	

6 Select Next.

7 Tab to select the second ConnectX-3 Ethernet HA port.

In the case of HA Fibre Channel, this will be the first port (Port 1) in slot 1 whose MAC address is one higher than the one selected for the first Ethernet HA port.

In the case of HA iSCSI and HA InfiniBand/SRP this will be the second Ethernet port (Port 2) in the card in slot 3 with a BusID of 0000:83:00.0

8 Repeat steps 2-5, setting a different IP Address for the second ConnectX-3 Ethernet HA port.

Idol2 - I Irstbu	JC @ TOII-OFQUSXON		
Network Card Se	etup		
General-Addre	ess-Hardware		
Device Type		Configuration Name	
Ethernet		↓ eth6	
() No Link an	nd IP Setup (Bonding Slaves) [] Us	e iBFT values	
() Dynamic Ad	ldress		
() 04-4111	UHCP 4 DHCP both ve	rsion 4 and b 4 million of the second s	이상 영양 경기 방송에서 관계하는 것이다.
IP Address	j assignea ir maaress	et Mack	
192 168 1 1	255	255 255 A	
Additional A	Idresses-		
Alias Nar	ne IP Address Netmask		
			이 옷을 물건을 다 같은 것을 해야 하는 것을 수 있다.
[Add][Edit	t][Delete]		
[Help]	LBackJ	LCance I J	[Next]
F4 Lola F2 old	F9 Campal: F10 Novt		

9 Select Next.

Configuring ConnectX-3 ports for iSCSI

To configure ConnectX-3 ports for iSCSI:

1 On the Network Configuration screen, select **Change** (bottom of the screen) and then **Network Interfaces**.

[Back]	Network Interfaces Reset to defaults	ort]	[Next]

The Network Settings screen is displayed with the detected network adapters listed.

2 Select an unconfigured ConnectX-3 port from the list.

ame	IP Address	Device	Note
etXtreme BCM5720 Gigabit Ethernet PCI	le Not configured		
etXtreme BCM5720 Gigabit Ethernet PCI	le Not configured		
thernet Network Card	10.60.35.41	eth0	
etXtreme BCM5720 Gigabit Ethernet PCI	le Not configured		
I27500 Family [ConnectX-3]	192.168.1.1	eth4	
T27500 Family [ConnectX-3]	192.168.2.1	eth5	
T27500 Family [ConnectX-3]	Not configured	eth6	
I27500 Family [ConnectX-3]	Not configured	eth7	
I27500 Family [ConnectX-3]	Not configured	eth8	
T27500 Family [ConnectX-3]	Not configured	eth9	

3 Select **Edit** (in the lower-left corner of the screen). [Add][Edit][Delete]

The Network Card Setup screen is displayed.

tuonk Cand Satur		
twork tard setup eneral-Address-Hardware		
Device Type	Configuration Name	
thernet	↓ eth8	
) No Link and IP Setup (Bonding Sl	aves) [] Use iBFT values	
) Dynamic Address		
) Statically assigned IP Address	DHCP both version 4 and b	
Address	Subnet Mask	
dditional Addresses		
Alias Name IP Address Netwask		
minus nume mi nuuress ne onusk		
[A]]][[]]][]]][]]][]]][]]][]]][]]][]]][
IHaa IILa IT IIDelete I		

4 Select Statically assigned IP Address.

Each iSCSI port must be configured on its own subnet. Also, it is a best practice to have the last octet of the IP address match the last octet of the host.

For example, with a host IP address of 100.128.10.41, you might configure the iSCSI ports for the following subnets:

- 192.168.**20**.41
- 192.168.**21**.41
- 192.168.**22**.41
- 192.168.23.41

Here is an example of unique subnet numbering for iSCSI ports in the user interface:

ame	IP Address	Device	Note
NetXtreme BCM5720 Gigabit Ethernet PCIe	Not configured		
NetXtreme BCM5720 Gigabit Ethernet PCIe	Not configured		
Ethernet Network Card	100.168.20.41	eth0	
NetXtreme BCM5720 Gigabit Ethernet PCIe	Not configured		
MT27500 Family [ConnectX-3]	192.168.20.41	eth4	
MT27500 Family [ConnectX-3]	192.168.21.41	eth5	
MT27500 Family [ConnectX-3]	192.168.22.41	eth6	
MT27500 Family [ConnectX-3]	192.168.23.41	eth?	

5 Enter the IP Address and Subnet Mask for your network.

Ethernet 1 eth8 () No Link and IP Setup (Bonding Slaves) [] Use iBFT values () Dynamic Address BHCP 1 DHCP both version 4 and 6]. (x) Statically assigned IP Address By Address Subnet Mask 192.168.22.41 Addresss Address Address Alias Name IP Address Netmask	
) No Link and IP Setup (Bonding Slaves) [] Use iBFT values) Dynanic Address DHCP both version 4 and 6 [4 x) Statically assigned IP Address P. Address Subnet Mask 22.168.22.41 /24 Additional Addresses Alias Nane IP Address Netmask	
Jugnanic Hodress DHCP both version 4 and 6 4 x) Statically assigned IP Address Subnet Mask 22.166.22.41 /24 Additional Addresses Address Alias Name IP Address Netmask Image: Submet Mask	
x) Statically assigned IP Address P Address 92.168.22.41 Additional Addresses Alias Name IP Address Netmask	
P Address Subnet Mask 92.168.22.41 >24 Additional Addresses Alias Name IP Address Netmask	
92.168.22.41 >24 Additional Addresses Alias Name IP Address Netmask	
Additional Addresses	
Alias Name IP Address Netmask	
EAdd1Edit1EDelete1	

- 6 Select Next.
- 7 On the Network Card Setup screen, press left-arrows to select General.
- 8 Tab to the Set MTU field.
- 9 Set MTU to **9000**.

NOTE: Ensure that the switches and routers on your network are configured to correctly handle this MTU size.

- 10 Select Next.
- 11 Repeat steps 2-10 until all four iSCSI ports are configured.

Setting hostname and routing information

To configure Hostname and routing information:

- 1 On the Network Settings screen, press the right arrow key to select Hostname.
- 2 Tab to the Hostname field and enter the Hostname for the DAAD.

- 3 Tab to the Domain Name field and enter the Domain Name.
- 4 Tab to the Name Servers fields and enter up to three Name Servers.



- 5 Press Tab until the focus is back on the Overview line.
- 6 Press the right arrow key to select Routing.

YaST2 –	firstboot 0 ion-c	of q05x8h		
Networl	k Settings			
[Overv	iew—Hostname/DNS-	-Routing		
				 Buddalogi (1998) (1998)
	Default Gateway 192 168 77 1			1
	[Routing Table			
	Destination	way Netmask Device Ontions		
		Eppel	Edit][Delete]	
[Help]		[Back]	[Cance]]	L OK 1
1				and the second se

7 Tab to the Default Gateway field and enter the Default Gateway.

8 Select OK.

The Saving Network Configuration Screen is displayed.



Setting time zone and NTP settings

To set Time Zone and NTP:

1 Tab to the Region field and use the arrow keys to select the region where the DAAD will be located.

YaSIZ = f Irs	tboot @ 10n-01 qu5x8n		
Clock and 1	'ime Zone		
Bertion		Time Zone	
Africa		Alaska (Anchorage)	
Argentin		Aleutian (Adak)	
Asia		Arizona (Phoenix)	
Atlantic		Boise	
Australi	n a seguri 1, 2 secondo en estructura en estructura en estructura en estructura en estructura en estructura en A destructuras en la districtura en estructura en estructura en estructura en estructura en estructura en estruc	Central (Chicago)	
Brazil		Fast Indiana (Indiananolis)	
Canada		Fastern (New York)	
Control	and South Amorica	Hausii (Henolulu)	
CENtral P4-		Induari (Mononea)	
ELC E	영화 뒷도 맛있는 것이 같아요. 것이 같아 같아 같아 같아 같아.	Indiana (narenyu)	
Clabal	방법에서 전문을 다 가지 않는 것이 많이 있는 것이 많이 있는 것이 가지 않는 것이다.	Indiana (retersbury)	
GIODAI		Indiana (leff City)	
Indian t	icean	Indiana (Vevay)	
nex1co		Indiana (Vincennes)	
Pacific		Indiana (Winamac)	
Russia		Indiana Starke (Knox)	
USA		Juneau	
	성장 이 것은 것은 것은 것 같은 것은 것은 것은 것은 것을 했다.	Kentucky (Louisville)	
		Kentucky (Monticello)	
		Menominee	
		Michigan (Detroit)	
	이 있는 사람들은 것 같은 것은 것은 것을 위한 것을 가지 않는 것을 가지 않는 것을 가지 않는 것을 했다. 같은 것은 것을 가지 않는 것을 가지 않는 것을 수 있다.	Mountain (Denver)	
	승규는 것은 것은 것은 것은 것은 것은 것은 것을 가지 않는 것을 하는 것을 했다.	Nome	
		North Dakota (Center)	
		North Dakota (New Salem)	
		Pacific (Los Angeles)	
	[1] 2019년 1월 1월 2019년 1월 19일 - 1월 19일 20일 20일 20일 20일 20일 20일 20일 2월 19일 - 1일 20일 20일 20일 20일 20일 20일 20일 20일 20일 20	Puerto Rico	
		Samoa (Pago Pago)	
		Shiprock	
	그는 그 같은 것 같이 있는 것 같은 것 같은 것 같이 있는 것 같은 것 같	Virgin Islands (St Thomas)	
		Yakutat	
		이 집에 가장 같은 것이 같은 것이 없는 것이 같이 많이 많이 많이 했다.	
	이는 것 같은 것은 것 같은 것은 것 같은 것은 것 같은 것 같 ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ?		
		이 사람이 많은 것은 것은 것은 바람은 것은 것을 하는 것을 가셨다.	
		이 사람 것 같은 것 같	
		Date and Time (NTP is configured)	
[v] Hande	ana Clock Set To UTC	2015-02-24 = 16.23.50	
		2013 02 21 10.23.30	[Change]
			renange
[Heln]	[Back]	[Abort]	[Next]
merbi		LINDING TO A STATE OF A	LICXU
D4 United D0	Deels FO About F40 News		

2 Tab to the Time Zone field and select the zone where the DAAD will be located.



3 Tab to the Date and Time field and select **Change**. The Change Date and Time screen is displayed.

CAUTION! If you are using an HA configuration you must configure DAAD to synchronize with NTP.

- 4 Tab to the Synchronize with NTP Server field and select it.
- 5 Tab to the NTP Server Address field and enter the address of the NTP server to synchronize with.
- 6 Tab to the Save NTP Configuration field and select it.

7 Tab to the Configure field and select it.

The Advanced NTP Configuration screen is displayed.

YaST2 - timezone @ c1node1		
Advanced NTP Configuration	Settings	
Start NTP Daemon () Only Manually (x) Now and On Boot		
Runtime Configuration Poli Auto	cyCustom Policy ▼	
Synchronization Type Addr Server 2.op	ress pensuse.pool.ntp.org	
[Add][Edit][Delete]		[Display Log]
[Help]	[Cancel]	[O K]
F1 Help F3 Add F4 Edit F5	Delete F9 Cancelmannet@.20K	Fusion-lo/Confidential 8

- 8 Select **Delete** to delete the default NTP configuration.
- 9 Select **Add** to add a new configuration.
- 10 In the New Synchronization screen that is displayed, select **Server**.

YaST2 - timezone	@ c1node1		
New Synchronizat	ion		
((X) Server		
	() R <mark>a</mark> dio Clock		
	() Outgoing Broadcast		
	() Incoming Broadcast		
[Help]	[Back]	[Abort]	[Next]
F1 Help F8 Back	F9 Abort F10 Next		

11 Select Next.

	ver sereen that is display		:55 ПСГО.
YaST2 - timezone	@ clnodel		
NTP Server	Server Settings ddress vour new server IP Dotions iburst Access Control Option	t] [Selectv]	
[Help] F1 Help F8 Back	[Back] F9 Abort F10 OK	[Abort]	[0 K]

12 In the NTP Server screen that is displayed, tab to select the Address field.

- 13 Type the NTP server address.
- 14 Select OK.
- 15 If you have additional NTP servers, repeat steps 9-14 to configure them.
- 16 Select **Accept** to save the NTP changes and continue.

Enabling cluster setup

To enable the HA cluster:

1 On the Cluster Setup screen, tab to the Enter Cluster Name field and enter a name for the Cluster.

CAUTION! The cluster name must be a DNS entry, not DHCP, and must be on the same subnet as the management IP address for the Dell Acceleration Appliance for Databases nodes. Also, do not enter the name or IP address of one of the currently existing nodes.

- 2 Tab to the Enter Cluster IP Address field and enter the IP address for the cluster.
- 3 Tab to the Primary Channel field and press the down arrow key on Bind Network Address drop-down menu.

4 From the drop-down menu, select the address you set for the first ConnectX-3 Ethernet HA port.

YaSTZ - firstboot @ ion-ofqU5x8h			
Cluster Setup			
[x] Enable Cluster			
Cluster Information			
Enter Cluster Name: daad-cluster			
Enter Cluster IP address:			
152.100.77.111			
[Primary Channel			
k Address:			
192.168.1.0 dress:			
152.100.77.0			
-Redundant Channel			
Bind Network Address:			
Multicast Address:			
226.95.1.1 Multicast Port:			
5407			
[Help]	[Back]	[Abort]	[Next]
F1 Halp F8 Back F9 Oboxt F10 Next			

5 Tab to the Redundant Channel field and press the down arrow key on Bind Network Address drop-down menu.

6 From the drop-down menu, select the address you set for the second ConnectX-3 Ethernet HA port.

YaST2 - firstboot 0 ion-ofq05x8h		
Cluster Setup		
[x] Enable Cluster		
Cluster Information Enter Cluster Name: daad-cluster Enter Cluster IP address:		
192.168.77.111	an a	
Primary Channel		
192.168.0.0		
226.94.1.1 Multicast Port:		
5405		
Redundant Channel-		
192.168.0.0 dress:		
rt:		
(Help]	[Back]	[Abort]
F1 Help F8 Back F9 Abort F10 Next		

7 Select Next.

Setting the admin user password

To set the admin user password:

1 Type the Dell Acceleration Appliance for Databases password for the admin user.

NOTE: If the password you selected is not sufficiently strong, a warning message is displayed so you can change the password, if necessary.

2 Retype the password you entered.

CAUTION! Be sure to record this password in a secure location in case it needs to be retrieved.

3 To test the Keyboard Layout or use the Expert Options, select those options on the screen.



If you want to change this password later, change the admin user and GUI passwords separately. For more information, see Changing Passwords in the *Dell Acceleration Appliance for Databases GUI Guide*.

Completing the DAAD configuration

After the configuration phases are complete, the Configuration Completed screen is displayed.

To complete DAAD configuration:

1 Select Finish .	
YaST2 - firstboot @ ion-ofq05x8h	
Configuration Completed	
Congratulations!	
The system configuration of the ION Accelerator is complete. After clicking Finish, follow the instructions on the console screen.	e
Visit us at www.sandisk.com.	
[Help] [Back] [Abort]	Finish]
F1 Help F9 Abort F10 Finish	

The DAAD system restarts and displays start-up messages. After a login prompt is displayed on the console, you can connect to DAAD for additional setup and configuration. An example screenshot is given here:

done done done done done done done done	Stanting Sustans Management Nata Engine	
Starting dam_sa_anewingsd: dome Starting for anexit dome Starting for anexit for anexit Starting for anexit fone Start	Starting Jostews nanogement bata Engric.	done
Starting dam_sa_sempler pilof: can't get program name from /proc/31175/stat done done done done done done done done	Starting dam _s _uotungtu.	done
Starting DSN SA Shared Services: done Joad SNP over InfiniBand protocol stack done Load SNP over InfiniBand protocol stack done Load SNP over InfiniBand protocol stack done Loading and configuring the nid-level SCSI target SCST done Starting floresaft floresaft Starting floresaft floresaft Starting floresaft floresaft Starting floresaft floresaft	Starting use sa coentegra.	aune
Starting DSM SA Shared Services: done Load SRP over InfiniBand protocol stack setting noop scheduler for fioa fiob fioc fiod Start all md done Load infereory USL. done Start all md done Start all md done Start all md done Werlify FMD passed: proceeding with startup starting for-saft: Start all md done Verify IAD passed: proceeding with startup starting for feed: 0000: 0000: 0400: 1452: 1403: 0038: 3611 Set rel_tyt.id on target feed: 0000: 0000: 0400: 1452: 1403: 0038: 3611 starting fire feed: 0000: 0000: 0455: 1403: 0038: 3621 Set rel_tyt.id on target feed: 0000: 0000: 0455: 1403: 0038: 3621 done Starting fire-samp-agents: 0K done Starting fire-sagre:: 0K </td <td>Starting dsm_sa_snmpd: pldof: can't get program name from /proc/311/5/stat</td> <td></td>	Starting dsm_sa_snmpd: pldof: can't get program name from /proc/311/5/stat	
Starting DSM SA Shared Services: done Load SRP over InfiniBand protocol stack addition of the protocol stack Load in orden configuring the nid-level SCSI target SCST done Starting fio-saft: done Starting fio-saft: done Starting fio-saft: done World yEds done Starting OpenAls-Corosync demon (corosync): starting OK starting OpenAls-Corosync demon (corosync): starting OK Set rel_tyt_id on target fees0:0000:0000:0000:0000:03:3af1 starting OpenAls-Corosync demon (corosync): starting OK Set rel_tyt_id on target fees0:0000:00000:0000:0000:03:3af2 starting OpenAls-Corosync demon (corosync): starting OK Set rel_tyt_id on target fees0:0000:00000:0000:0000:3af2 starting OpenAls-Corosync demon (corosync): starting OK Set rel_tyt_id on target fees0:0000:00000:0000:0000:3af2 starting (no target fees0:0000:00000:0000:0000:3af2 Set rel_tyt_id on target fees0:0000:00000:0000:0000:0000:0000:000		
Starting IST 36 Shared Services: done Load SRP over InfiniBand protocol stack Load SRP over InfiniBand protocol stack Satting nong scheduler for fioa fiob fioc fiod Start all nd Loading and configuring the mid-level SC31 target SC3T Starting for-saft: done Starting for-saft: done Starting for-saft: done Starting for-saft: done Uerify TRU passed: proceeding with startup Starting for acht target Set rel_tyt_id on target fe80:0000:0000:0000:1452:1403:0038:3af1 Set rel_tyt_id on target fe80:0000:0000:0000:3f452:1403:0038:3af1 Set rel_tyt_id on target fe80:0000:0000:0000:0000:3f52:1403:0038:3af1 Enabling target ib_sryt fe80:0000:0000:0000:0000:3f52:1403:0038:3af1 Enabling target ib_sryt fe80:0000:0000:0000:0000:3f52:1403:0038:3af2 Enabling target ib_sryt fe80:0000:0000:0000:0000:0000:3f52:1403:0038:3af2 Enabling target ib_sryt fe80:0000:0000:0000:0000:0000:3f52:1403:0038:3af2 Enabling target ib_sryt fe80:0000:0000:0000:0000:3f52:1403:0038:3af2 Enabling target ib_sryt fe80:0000:0000:0000:0000:0000:3f52:1403:0038:3af2 Enabling target ib_sryt fe80:0000:0000:0000:00		done
Load SRP over InfiniBand protocol stack Load ioMenory USL Setting nop scheduler for fioa fiob fice field Start all nd Loading and configuring the mid-level SCSI target SCST done Starting fio-saft: done Starting for-saft: done Starting forester the startup Starting OpenHIS-Corosync daemon (corosync): starting OK Set rel_tytid on each target Set rel_tytid on target fe80:0000:00000:0000:0000:0000:3311 Set rel_tytid on target fe80:0000:00000:0000:0000:3321 Set rel_tytid on target fe80:0000:00000:0000:0000:333:341 Set rel_tytid on target fe80:0000:00000:0000:0000:3322 Set rel_tytid on target fe80:0000:00000:0000:333:341 Enabling target ib srpt fe80:0000:0000:0000:0000:333:341 Enabling target ib srpt fe80:0000:0000:0000:0000:333:3421 Starting fio-smpragentx: 0K Starting fio-smpragentx: 0K Starting fio-smpragentx: 0K Starting fio-smpragent: 0K Marting fio-smpragent: 0K Marting fio-smpragent: 0K Marting fio-agent: 0K Marting fio-agent: 0K Marting fio-agent: 0K Starting fio-agent: 0K Marting fio-agent: 0K Marting fio-agent: 0K Marting fio-agent: 0K Marting fio-agent: 0K Marting fio-agent: 0K Starting fio-agent: 0K Marting fio-agent: 0K Marting fio-agent: 0K Marting fio-agent: 0K Marting fio-agent: 0K Marting fio-agent: 0K Starting fio-agent: 0K Marting fio-agent: 0K Starting fio-agent: 0K Starting fio-agent: 0K Marting fio-agent: 0K Starting fio-agent: 0K Starting fio-agent: 0K Starting fio-agent: 0K Starting fio-agent: 0K Starting fio-agent: 0K Starting fio-agent: 0K Marting fio-agent: 0K Starting fio-agent: 0K Marting fio-agent: 0K Starting fio-agent: 0K	Starting DSM SA Shared Services:	done
Load SMP over huf initiand protocol stack Load ioMenony USL. Setting noop scheduler for fioa fiob fic fied Start all nd Loading and configuring the nid-level SCSI target SCST done Starting for-saft: done Starting for-saft: done Starting for-saft: done Werify FRU passed: proceeding with startup Starting for each target Set rel_tgf_id on each target Set rel_tgf_id on each target fe80:0000:0000:f452:1403:0038:3af1 Set rel_tgf_id on target fe80:0000:0000:f452:1403:0038:3af2 Set rel_tgf_id on target fe80:0000:0000:f452:1403:0038:3af1 Set rel_tgf_id on target fe80:0000:0000:f452:1403:0038:3af1 Set rel_tgf_id on target fe80:0000:0000:f452:1403:0038:3af1 Set rel_tgf_id on target fe80:0000:0000:f452:1403:0038:3af1 Eaabling target ib_srpt fe80:0000:0000:0000:3af2 Eaabling target ib_srpt fe80:0000:0000:0000:3af2 Starting fio-samp-agentx: 0K Starting fio-agent: 0K St		
Laad ioNenory USL Setting noop scheduler for fia fib fic fid Start all nd Laading and configuring the nid-level SCSI target SCST done Starting fio-saft: done Starting for-saft: done Starting penfils/Corosync daenon (Corosync): starting OK Set rel_tgt_id on target fe80:0000:0000:f452:1403:0038:3af1 Set rel_tgt_id on target fe80:0000:0000:f452:1403:0038:3af2 Set rel_tgt_id on target fe80:0000:0000:f452:1403:0038:3af2 Set rel_tgt_id on target fe80:0000:0000:f452:1403:0038:3a71 Enabling target ib_srpt fe80:0000:0000:f452:1403:0038:3a71 Enabling target ib_srpt fe80:0000:0000:f452:1403:0038:3a71 Enabling target ib_srpt fe80:0000:0000:f452:1403:0038:3a72 Enabling target ib_srpt fe80:0000:0000:f452:1403:0038:3c71 Starting fio-samp-agentx: 0K done Starting fio-samp-agentx: 0K done Mater Resource Control: runlevel 3 has been done Mater Resource Control: runlevel 3 has been Copyright (c) 2015 Sanbisk Corp. and/or all its affiliates. All rights reserved. 	Load SRP over InfiniBand protocol stack	
Setting moop scheduler for fina fibb finc find Start all nd Loading and configuring the nid-level SCSI target SCST done Starting fio-saft: done done Starting fio-saft: done Starting fio-saft: done Starting fio-saft: done done done Starting fio-saft: don target fe0:0000:0000:f452:1403:0038:3af1 Start I_tgf_id on target fe0:0000:0000:f452:1403:0038:3af2 St rel_tgf_id on target fe0:0000:0000:f452:1403:0038:3af1 Ext rel_tgf_id on target fe0:0000:0000:f452:1403:0038:3af2 Ext rel_tgf_id on target fe0:0000:0000:f452:1403:0038:daf2 Ext rel_tgf	Load ioMenory VSL	
Start all nd Loading and configuring the nid-level SCSI target SCST done Starting flo-saft: done Starting flo-saft: done Starting penfils/Corosync daenon (Corosync): starting OK Set rel_tgt_id on target fe80:0000:0000:0000:f452:1403:0038:3af1 Set rel_tgt_id on target fe80:0000:0000:0000:f452:1403:0038:3af2 Set rel_tgt_id on target fe80:0000:0000:0000:f452:1403:0038:3a71 Earbling target ib_srpt fe80:0000:0000:0000:f452:1403:0038:3a71 Enabling target ib_srpt fe80:0000:0000:0000:f452:1403:0038:3a71 Enabling target ib_srpt fe80:0000:0000:0000:f452:1403:0038:3a71 Enabling target ib_srpt fe80:0000:0000:0000:f452:1403:0038:3a72 Enabling target ib_srpt fe80:0000:0000:f452:1403:0038:3a72 Enabling target ib_srpt fe80:0000:0000:f452:1403:0038:3c71 Starting flo-snmp-agentx: OK Starting flo-snmp-agentx: OK Starting flo-snmp-agentx: OK done Starting flo-snmp-agentx: OK done Starting flo-snmp-agentx: OK done Attribution: trunevel 3 has been Copyright (c) 2015 SanDisk Corp. and/or all its affiliates. fll rights reserved. 	Setting moop scheduler for fioa fiob fioc fiod	
Loading and configuring the nid-level SCSI target SCST done Starting fio-saft: done Shutting down sfcb: done Starting sfcb: done twrify FRU passed: proceeding with startup Starting OpenAIS-Corosync daenon (corosync): starting OK Set rel_fgt_id on target fe80:0000:0000:0452:1403:0038:3af1 Set rel_fgt_id on target fe80:0000:0000:0452:1403:0038:3af2 Set rel_fgt_id on target fe80:0000:0000:0452:1403:0038:3af2 Set rel_fgt_id on target fe80:0000:0000:0452:1403:0038:3af1 Eacling target ib_srpt fe80:0000:0000:0452:1403:0038:3af1 Enabling target ib_srpt fe80:0000:0000:0000:0452:1403:0038:3af1 Enabling target ib_srpt fe80:0000:0000:0000:0452:1403:0038:3af1 Enabling target ib_srpt fe80:0000:0000:0000:0000:0000:0000:0000:	Start all md	
Starting fio-saft: done Starting sfcb: done Starting sfcb: done Starting sfcb: done Starting penAlS2Corosync daenon (corosync): starting OK Set rel_tgt_id on each target Set rel_tgt_id on target fe80:0000:0000:f452:1403:0038:3af1 Set rel_tgt_id on target fe80:0000:0000:f452:1403:0038:3a72 Set rel_tgt_id on target fe80:0000:0000:f452:1403:0038:3a72 Set rel_tgt_id on target fe80:0000:0000:f452:1403:0038:3a71 Enabling target ib_srpt fe80:0000:0000:f452:1403:0038:3a72 Enabling target ib_srpt fe80:0000:0000:f452:1403:0038 Enabling target ib_srpt fe80:0000:0000:f452:1403:0038 Enabling targ	Loading and configuring the mid-level SCSI target SCST	done
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WARNING: This is a private system. Do not attempt to login unless you are an authorized user. Any authorized or unauthorized access or use may be monitored and can result in criminal or civil prosecution under applicable law. 	Copyright (c) 2015 SanDisk Corp. and/or all its affiliates. All rights reserved.	
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To further administer go to: https://192.168.77.111 daad-ib-1 login:	System Serial Number: "CBGP842"	
https://192.168.77.111 daad-ib-1_login:	To further administer go to:	
daad-ib-1 login:	https://192.168.77.111	
	daad-ib-1 login:	
Configuring FC and IB for HA

The steps for configuring a fibre channel DAAD system for HA and an InfiniBand/SRP DAAD system for HA are very similar. They only difference is that with fibre channel the Ethernet HA ports are both on the Mellanox adpater in Slot 1, whereas with InfiniBand/SRP the one HA port is on the adapter in Slot 1 and the other port is on the adapter in Slot 3.

To configure either your fibre channel or your InfiniBand/SRP DAAD system for HA, perform the following steps:

- Configure the management port
- Configure the ports on the Mellanox card for HA
- Set the Hostname and Routing information for DAAD
- Set the Time Zone and NTP settings
- Enable the Cluster Setup
- Set the admin user password
- Finish the configuration

NOTE: If you are planning to deploy DAAD in an HA configuration, ensure that both Infiniflash systems have the same number of Infiniflash drive cards in the same slots.

Configuring the management port

The management port is one you have connected by an external cable to your network and is externally visible. This port must be configured so your network hardware communicates with the Dell Acceleration Appliance for Databases.

To configure the management port:

1 On the Network Configuration screen, select **Change** (bottom of the screen) and then **Network Interfaces**.

[Back] Network Interfaces Reset to defaults ort] [Next]				
	[Back]	Network Interfaces Reset to defaults	ort]	[Next]

The Network Settings screen is displayed with the detected network adapters listed.

2 Select the management IP card from the list.

YaS	BTZ - first	tboot 🛛 i	ion-of qO	5x8h				
Ne	twork Set	tings	2NO 2					
ſ	lverview-	lostname/	/DNS-Rou	iting				
	Name				1	IP Address	Device	Note
	NetXtreme	BCM5720	Gigabit	Ethernet	PCIe	Not configured		
	NetXtreme	BCM5720	Gigabit	Ethernet	PCIe	Not configured		
	Ethernet N	Network (Card			DHCP	eth0	
	NetXtreme	BCM5720	Gigabit	Ethernet	PCIe	Not configured		

3 Select **Edit** (in the lower-left corner of the screen). [Add][Edit][Delete]

The Network Card Setup screen is displayed.



- 4 Select Statically assigned IP Address.
- 5 Enter the IP Address and Subnet Mask for your network.
- 6 Select Next.

Configuring ConnectX-3 ports for HA

To configure the ConnectX-3 ports for HA:

1 Tab to select the first ConnectX-3 Ethernet HA port. This will be the second port (Port 2) in the card in slot 1 with a BusID of 0000:81:00.0.

```
M127500 Family (ConnectX+31)(Noteconnected) (connected)
MAC : f4:52:14:38:3f:22
BusID : 0000:81:00.0
Device Name: eth5
The device is not configured. Press Edit to configure.
```

- 2 Select Edit.
- 3 Tab until the IP Address field is selected.
- 4 Enter the IP Address for the port.

NOTE: Use the static IP addresses and subnet masks shown in the table here for the cluster interconnect ports. Using other IP addresses or subnet masks may lead to unexpected behavior.

	DAAD 1	DAAD 2
First HA Port	192.168. 1.1	192.168. 1.2
Second HA Port	192.168. 2.1	192.168. 2.2
Subnet Mask	255.255.255.0	255.255.255.0

5 Press Tab and enter **255.255.255.0** for the Subnet Mask.

YaST2 – firstboot @ ion-ofq05x8h						
Network Cand Setur						
General Address Hardware						
Device Type	Configuration Name					
Ethernet						
() No Link and IP Setup (Bonding Slaves) [] Use iBFT values					
() Dynamic Address						
DHCP 1 DHCP bo	th version 4 and 614					
(x) Statically assigned IP Address						
192 168 0 1						
Additional Addresses						
Alias Name IP Address Netmask						
[4] [4] 이 이 이 이 이 이 이 이 이 이 이 이 이 이 이 이 이 이 이						
그는 것이 나는 것이 같아요. 것이 같은 것은 것이 같이 것이 같아.						
이 같은 방법에서 관계적으로 한것에 가격하는 것 같은 것을 가 있었다.						

6 Select Next.

7 Tab to select the second ConnectX-3 Ethernet HA port.

In the case of HA Fibre Channel, this will be the first port (Port 1) in slot 1 whose MAC address is one higher than the one selected for the first Ethernet HA port.

In the case of HA iSCSI and HA InfiniBand/SRP this will be the second Ethernet port (Port 2) in the card in slot 3 with a BusID of 0000:83:00.0

8 Repeat steps 2-5, setting a different IP Address for the second ConnectX-3 Ethernet HA port.

YaSIZ	- ilrstboot e lon-oiqesxan			
Netwo	ork Card Setup			
-Gene	eral-Address-Hardware			
Dev	vice Type	Configurati	ion Name	
Eth	nernet	↓ eth6		
	No Link and IP Setup (Bonding	Slaves) [] Use iBFT values		
	DUCP	DHCP both uppeion 4 and 6#1		
(\mathbf{x})	Statically assigned IP Address			
IP A	ddress	Subnet Mask		
192.	.168.1.1	255.255.255.0		
[fAdd	litional Addresses			
	HIIAS NAME IF HAAPESS NECHASK			
	[
	같은 경험적인 것은 것은 것으로 같은 것이라.			
	[Add][Edit][Delete]			
[Heln]		[Back]	[Cance]]	[Nevt]
- the the			Lounder J	LIICX (J
F1 He1	n F3 Add F9 Cancel: F10 Next			

9 Select Next.

Setting hostname and routing information

To configure Hostname and routing information:

- 1 On the Network Settings screen, press the right arrow key to select **Hostname**.
- 2 Tab to the Hostname field and enter the Hostname for the DAAD.
- 3 Tab to the Domain Name field and enter the Domain Name.

4 Tab to the Name Servers fields and enter up to three Name Servers.

la de la constancia de la constancia De segui recelerre e regrésario de la constancia

- 5 Press Tab until the focus is back on the Overview line.
- 6 Press the right arrow key to select Routing.

YaST2	firstboot @ ion-ofq05x8h		
Netuo	k Settings		
[Over	iew—Hostname/DNS— Routing ————		_
	Default Gateway		
	192.168.77.1		
	Routing Table		
	Destination Gateway Netmask Device Options	3	
			Contra Contra
		· · · · · · · · · · · · · · · · · · ·	en sakatuk je je Konsta
		[Add][Edit][Delete]	
		n de la general participation de la construction de la construction de la construction de la construction de la Anna a la construction de la constru	
[Help]	[Back]	[Cancel]	OK 1

7 Tab to the Default Gateway field and enter the Default Gateway.

8 Select **OK**.

The Saving Network Configuration Screen is displayed.



Setting time zone and NTP settings

To set Time Zone and NTP:

1 Tab to the Region field and use the arrow keys to select the region where the DAAD will be located.

	похор		
Clock and Time Zone			
Region		Time Zone	
Africa		Alaska (Anchorage)	
Argentina		Aleutian (Adak)	
Asia		Arizona (Phoenix)	
Htlantic		Boise	
Hustralla		Central (Chicago)	
Brazil		East Indiana (Indianapolis)	
Canada			
Central and South Hme	rica	Hawall (Honolulu)	
EUC		Indiana (Patenshung)	
Lurope		Indiana (retersburg)	
GIODAI Indian Orașe		Indiana (leff City)	
Maxico		Indiana (Uinconnoc)	
nex1co		Indiana (Vincennes)	
Pacifi 10		Indiana (Winamac)	
RUSSId		Thalana Starke (MOX)	
uan		Ventuelau (Leuieuille)	
		Kentucky (Louisville)	
		Monominoo	
		Michigan (Defacit)	
		Mountain (Denuen)	
		None	
		Nonth Dakota (Center)	
		North Dakota (New Salem)	
		Pacific (Los Angeles)	
		Puento Pico	
		Pares (Pare Pare)	
		Sallua (Tayu Tayu)	
		Ulingin Johnson (St. Thense)	
		VIPUTATA ISTATION (ST TRUMAS)	
		Yakutat	
		그는 방법 사람은 동안에 가지 않는 것을 것을 가지?	
		이 집에 가지 않는 것은 것은 것은 것은 것을 많이 많이 했다.	
		방법 김 사람이 많은 것이 있는 것을 많이 많이 많다.	
승규는 분석으로 가지 않는 것 같아.			
		Data and Time (NTD is santismed)	
[] U	T- 1170	pate and lime (MIP is configured)	
LXI Hardware Clock Set		2015-02-24 - 16:23:50	
			IChangeI
[Help]	[Pack]	[About]	[Nevt1
rue pi	LBACKI	LINDIAL	Inext1
	P10 Novt		

2 Tab to the Time Zone field and select the zone where the DAAD will be located.



3 Tab to the Date and Time field and select **Change**. The Change Date and Time screen is displayed.

CAUTION! If you are using an HA configuration you must configure DAAD to synchronize with NTP.

- 4 Tab to the Synchronize with NTP Server field and select it.
- 5 Tab to the NTP Server Address field and enter the address of the NTP server to synchronize with.
- 6 Tab to the Save NTP Configuration field and select it.

7 Tab to the Configure field and select it.

The Advanced NTP Configuration screen is displayed.

YaST2 - timezone @ c1node	e1	
Advanced NTP Configurat: General Settings—Secu	<mark>ion</mark> rity Settings	
Start NTP Daemon () Only Manually (x) Now and On Boot		
Runtime Configuration Auto	PolicyCustom Policy	
Synchronization Type Server	Address 2.opensuse.pool.ntp.org	
[Add][Edit][Delete]		[Display Log]
[Help]	[Cancel]	[ОК]
F1 Help F3 Add F4 Edit	F5 Delete F9 Cancelman640,201	Fusion-lo Confidential 8

- 8 Select **Delete** to delete the default NTP configuration.
- 9 Select **Add** to add a new configuration.
- 10 In the New Synchronization screen that is displayed, select **Server**.

YaST2 - timezone	@ clnodel		
New Synchronizat	ion		
	Туре		
((x) Server		
	() R <mark>a</mark> dio Clock		
	() Outgoing Broadcast		
	() Incoming Broadcast		
[Help]	[Back]	[Abort]	[Next]
F1 Help F8 Back	F9 Abort F10 Next		

11 Select Next.

12 In the NTP Server screen that is displayed, tab to select the Address field.

- 13 Type the NTP server address.
- 14 Select **OK**.
- 15 If you have additional NTP servers, repeat steps 9-14 to configure them.
- 16 Select **Accept** to save the NTP changes and continue.

Enabling cluster setup

To enable the HA cluster:

1 On the Cluster Setup screen, tab to the Enter Cluster Name field and enter a name for the Cluster.

CAUTION! The cluster name must be a DNS entry, not DHCP, and must be on the same subnet as the management IP address for the Dell Acceleration Appliance for Databases nodes. Also, do not enter the name or IP address of one of the currently existing nodes.

- 2 Tab to the Enter Cluster IP Address field and enter the IP address for the cluster.
- 3 Tab to the Primary Channel field and press the down arrow key on Bind Network Address drop-down menu.

4 From the drop-down menu, select the address you set for the first ConnectX-3 Ethernet HA port.

YaST2 - firstboot @ ion-ofq05x8h			
Cluster Setup			
[X] Enable Cluster			
Cluster Information			
Enter Cluster Name:			
Enter Cluster IP address:			
192.168.77.111			
Primary Channel			
192.168.0.0			
192.168.1.0 dress:			
192.168.77.8			
	we want the second s		
Redundant Channel			
Dina network nauress.			
Multicast Address:			
Multicast Port:			
5407			
[Help]	[Back]	[Abort]	[Next]
Fi John F9 Pack F9 Chowt F10	Next		

5 Tab to the Redundant Channel field and press the down arrow key on Bind Network Address drop-down menu.

6 From the drop-down menu, select the address you set for the second ConnectX-3 Ethernet HA port.

YaST2 - firstboot 0 ion-ofq05x8h		
Cluster Setup		
[x] Enable Cluster		
Cluster Information Enter Cluster Name: daad-cluster		
Enter Cluster IP address: 192.168.77.111		
Primary Channel- Bind Network Address: 192.168.0.0		
Multicast Address: 226.94.1.1		
5405		
Redundant Channel k Address:		
192.168.77.0 192.168.0.0 dress:		
152.100.1.0 rt:		
[Help]	[Back]	[Abort]
F1 Help F8 Back F9 Abort F10 Next		

7 Select Next.

Setting the admin user password

To set the admin user password:

1 Type the Dell Acceleration Appliance for Databases password for the admin user.

NOTE: If the password you selected is not sufficiently strong, a warning message is displayed so you can change the password, if necessary.

2 Retype the password you entered.

CAUTION! Be sure to record this password in a secure location in case it needs to be retrieved.

- 3 To test the Keyboard Layout or use the Expert Options, select those options on the screen.
- 4 Select Next.

Password for the GUI/LOCAL System Administrator "admin" Do not forget the password. If you decide to change it later, you can do so via the GUI or CLI. Password	
Do not forget the password. If you decide to change it later, you can do so via the GUI or CLI. Password	
Do not forget the password. If you decide to change it later, you can do so via the GUI or CLI. Password ********	
Do not forget the password. If you decide to change it later, you can do so via the GUI or CL1. Password ********	
Do not forget the password. If you decide to change it later, you can do so via the GUI or CLI. Password ********	
Do not forget the password. If you decide to change it later, you can do so via the GUI or CLI. Password ********	
Do not forget the password. If you decide to change it later, you can do so via the GUI or CLI. Password ********	
Do not forget the password. If you decide to change it later, you can do so via the GUI or CLI. Password	
Do not forget the password. If you decide to change it later, you can do so via the GUI or CLI. Password	
Do not forget the password. If you decide to change it later, you can do so via the GUI or CLI. Password	
you can do so via the GUI or CLI. Password *******	
Passuord *******	
Confirm Password	
Test Keyboard Layout	
LExpert UptionsJ	
에서 가장 아이들에 가장 것은	
[Help] [Back] [Abort] [Next	

If you want to change this password later, change the admin user and GUI passwords separately. For more information, see Changing Passwords in the *Dell Acceleration Appliance for Databases GUI Guide*.

Completing the DAAD configuration

After the configuration phases are complete, the Configuration Completed screen is displayed.

To complete DAAD configuration:

YaST2 - firstboot @ ion-ofq05x8h Configuration Completed Congratulations!
Configuration Completed Congratulations!
Congratulations!
Congratulations!
The system configuration of the ION Accelerator is complete. After clicking Finish, follow the instructions on the console screen.
Visit us at www.sandisk.com.
[Help] [Rack] [Abowt] [Divise]
Fildeln F9 Abort 200 Finish

The DAAD system restarts and displays start-up messages. After a login prompt is displayed on the console, you can connect to DAAD for additional setup and configuration. An example screenshot is given here:

Starting Sustems Management Data Engine'	
Starting dem sa datamend:	done
Starting dsm_sa_eventurd:	done
Starting dsm sa snmud: pidof: can't get program name from /proc/31175/stat	
	done
Starting DSM SA Shared Services:	done
Load SRP over InfiniBand motocol stack	
Setting non scheduler for fina find find	
Start all md	
Loading and configuring the mid-level SCSI target SCST	done
Starting the contributing the with level ocor target ocor	done
Shutting for state.	done
Sharting above	dono
Juarting Study	aune
Verify the passes, proceeding with startup	
Starting UpenHis/Corosync adenon (corosync): starting UK	
Set rel_tgt_1d on each target	
Set rel_tgt_id on target fe80:00000:00000:f952:1403:0038:3af1	
Set rel_tgt_id on target fe80:00000:0000:00001:452:1403:0038:3a72	
Set rel_tgt_id on target fe80:0000:0000:0000:f452:1403:0038:3f21	
Set rel_tgt_id on target fe80:0000:0000:0000:f452:1403:0038:3c71	
Enabling target ib_srpt fe80:0000:0000:0000:f452:1403:0038:3af1	
Enabling target ib_srpt fe80:0000:0000:0000:f452:1403:0038:3af2	
Enabling target ib_srpt fe80:0000:0000:0000:f452:1403:0038:3f21	
Enabling target ib_srpt fe80:0000:0000:0000:f452:1403:0038:3c71	
Starting snmpd	done
Starting fio-snmp-agentx: OK	done
Starting fio-msrv: OK	done
Starting fio-agent: OK	done
Starting ion:	done
Master Resource Control: runlevel 3 has been	reached
Copyright (c) 2015 SanDisk Corp. and/or all its affiliates. All rights reserved.	
when the instance of the second of the secon	
authorized user. Any authorized or unauthorized access or use may be multipled	
and can result in criminal or civil prosecution under applicable law.	
Welcome to SanDisk ION Accelerator 2.5.1-364	
System Serial Number: "CB6P842"	
To further administer go to:	
https://192.168.77.111	

Connecting to DAAD

NOTE: If you are setting up a permanent HA cluster, Dell recommends that you connect to each node. By connecting to the nodes, in case of a failback, the first-time setup on the second node is not necessary.

You can access and use the Dell Acceleration Appliance for Databases software by using two methods: the CLI or the GUI. The address of the DAAD system is displayed on the console.



Logging in through the CLI

- 1 At the login prompt, type **admin** as the username.
- 2 At the password prompt, type the password you created in First Boot.
- 3 After you log in to the Dell Acceleration Appliance for Databases, use the *Dell Acceleration Appliance for Databases CLI Reference* for instructions about setting up and managing your DAAD storage.

Logging in through the GUI

When you access the Dell Acceleration Appliance for Databases URL, the admin username and password login prompt is displayed:

- 1 If not pre-poulated, type **admin** in the Username box.
- 2 Type the password in the Password box. (This is the password you created in First Boot configuration.)

3 Click Login.

Acceleration /	DELL Appliance for [Databases	
User Name: admin	Password:		
	Log In		

The SSL Certificate Options dialog box is displayed. By default, the pre-configured option is selected.

REMOTE ACCESS

.....

To allow remote connections, you must enab	le and configure the remote access	settings.
Agent Push Frequency	20	seconds
Server Address (URL)		
Host Name 🕕	test.int.company.com	
Port	443	
SSL Certificate Options		
Choose the certificate type that should be us	ed for the SSL connection.	
Pre-configured SSL certificate (Less sec	ure)	
This certificate type prevents the agent matches the certificate, and will cause certificate.	from validating that this server's hose web browsers to warn of an untrust	stname ed
Custom SSL certificate (More secure)		

Save Changes

4 To use the less-secure pre-configured SSL certificate, click **Save Changes**.

Or, to use a custom SSL certificate, click **Custom SSL certificate (more secure)**, and then click **Save Changes**.

0	Custom SSL certificate (More secure)		
	NOTE: Custom certificates must be in	n PEM format	t.
	Key	Browse	No file selected.

Certificate	Browse_	No file selected
CA Chain (optional)	Browse_	No file selected

Save	Changes
04.0	onungoo

NOTE: The default **Use pre-configured SSL Certificate**" option is less secure, as it causes untrusted certificate warnings to appear.

5 Click Save Changes.

NOTE: If the port, host name, or SSL information has changed, the service restarts in a few seconds, and the browser is redirected to the port you specified.

SERVICE RESTARTING	X CLOSE
Redirecting to: https://10.60.32.47	
Redirecting in 7 second	ds <u>Cancel</u>

If the host name has changed, the service restarts, and the login process is initiated again. After re-direction, the login dialog box is displayed again.

6 Log in with the same username and password that you entered earlier.

The software is now configured so you can begin managing your Dell Acceleration Appliance for Databases. The Overview screen is displayed as shown in the *Basic Tasks and Overview Tab* section of the *Dell Acceleration Appliance for Databases GUI Guide*.

NOTE: For items not covered in the steps 1-6, see Remote Access in the *Dell Acceleration Appliance for Databases GUI Guide*.

If you want to change the admin password, see Changing Passwords in the *Dell Acceleration Appliance for Databases GUI Guide..*

NOTE: The admin account allows up to 10 concurrent sessions to run on the Dell Acceleration Appliance for Databases.

7 After you are logged in to the Dell Acceleration Appliance for Databases, see the *Dell Acceleration Appliance for Databases GUI Guide* for instructions on how to set up and manage your DAAD storage.

Backing up DAAD configuration

NOTE: It is a best practice to save and back up configurations of your Dell Acceleration Appliance for Databases system on a regular basis. As you set up storage pools, create volumes, and manage initiator groups, ensure that you back up your current configuration. For more information about backing up and restoring configurations, see the config commands in the *Dell Acceleration Appliance for Databases CLI Reference Guide*.

To back up the Dell Acceleration Appliance for Databases configuration:

1 Create a backup of the current configuration by running config:backup.

For example, the following commands create an XML backup that can be used later for a restore:

config:backup --host <hostname> --directory <path> --user <username> -password <password>

2 Store the configuration in a location other than on the DAAD host.

Changing network settings

This section describes the tasks to change the network settings for the Dell Acceleration Appliance for Databases nodes after they have been configured in the First Boot process. For information about using the system:setup command referred to in this section, see the *Dell Acceleration Appliance for Databases CLI Reference*.

Changing a node host name in a cluster

NOTE: Changing a node host name requires cluster downtime.

- 1 Ensure that both nodes are turned on.
- 2 Close all active sessions by disabling or disconnecting all target ports.
- 3 At the CLI, run **system:setup lan** to view the Setup dialog box for LAN configuration.
- 4 Select the Hostname/DNS tab.
- 5 Change the name of the node in the dialog box.
- 6 Select **OK**. Both nodes will restart one at a time.
- 7 Repeat steps 5 and 6 for the second node in the cluster.

Changing the management IP address

NOTE: While changing the management IP address do not change any values for the gateway IP address. To change the gateway IP address perform the procedure Changing the gateway IP address on page 96 as a separate step.

- 1 Ensure that both nodes are online.
- 2 On the first node, at the CLI, enter maintenance on
- 3 Enter system:setup lan to view the Setup dialog box for LAN configuration.
- 4 Edit the Ethernet adapter configured with the management IP.

The Network Card Setup dialog box is displayed.

5 Change the management IP address in the dialog box.

NOTE: Ensure that the host name that may be associated with the IP address in your network's DNS matches the host name set for the DAAD system.

- 6 Select **OK**. The node with the cluster IP address will fail over to the other node.
- 7 Enter maintenance off
- 8 On the second node, at the CLI, enter maintenance on
- 9 Repeat steps 3-7 on the second node.

Changing the management IP address to or from DHCP

- 1 Ensure that both nodes are online.
- 2 At the CLI, enter maintenance on
- 3 Enter system: setup lan to view the Setup dialog box for LAN configuration.
- 4 On the Network Card Setup screen, you can change the IP address setting to **Dynamic Address** or **Statically assigned IP Address**.

NOTE: Ensure that the host name that may be associated with the IP address in your network's DNS matches the host name set for the DAAD system.

- 5 Select **OK**. The node with the cluster IP address will fail over to the other node.
- 6 Enter maintenance off

Changing the DAAD cluster name or IP address

- 1 Ensure that both nodes are online.
- 1 On the first node, at the CLI, enter maintenance on
- 2 Enter system: setup cluster to view the Setup dialog box for cluster configuration.
- 3 Change the cluster name or IP address in the dialog box.
- 4 Select OK.
- 5 Enter maintenance off
- 6 On the second node, at the CLI, enter maintenance on
- 7 Repeat steps 3-6 on the second node.

Changing the gateway IP address

- 1 Ensure that both nodes are turned on.
- 2 At the CLI, run <code>system:setup lan</code> to view the Setup dialog box for LAN configuration.
- 3 Select the Routing tab in the dialog box.
- 4 Change the gateway IP address.
- 5 Select OK.

Changing IP addresses for cluster interconnect ports

NOTE: You can change interconnect ports only when no volumes or LUNs are configured.

- 1 Ensure that both nodes are turned on.
- 2 At the CLI, run system: setup lan to view the Setup dialog box for LAN configuration.
- 3 In the dialog box, change the cluster interconnect IP address for the adapters configured as HA ports.
- 4 Select OK.
- 5 Restart both nodes.

Changing the iSCSI port IP address

- 1 Ensure that both nodes are turned on.
- 2 Enter maintenance on
- 3 At the CLI, run system: setup lan to view the Setup dialog box for LAN configuration.
- 4 Change the iSCSI port IP address in the dialog box.
- 5 Select OK.
- 6 For Linux initiators:
 - a Log out of all related target portals by using the following command: iscsiadm -m node -U all
 - b Remove old target ports by using the following command:

```
iscsiadm -m node -p <oldIPaddress> -o delete
Where
```

oldIPaddress—is the IP address of one of iSCSI ports you want to change. Repeat this step for all the old target ports that you want to change.

- c Add the new target session to the initiator by running the following command: iscsiadm -m discovery -t st -p <new iSCSI IP address>
- d For Linux initiators, log in to the target (all sessions) from the initiator: iscsiadm -m node -1
- e $\$ Run the CLI command initiators $\ \ \, \mbox{-dt}$ to view the new initiator.
- f Add this initiator to an existing group:

initiator:update -a <inigroup name> <initiatoriqn#target IP Address>

- 7 For Windows initiators:
 - a Disconnect and remove old target ports by clicking
 iSCSI Initiator > Discovery and removing old target ports with old IP addresses
 - b Click iSCSI Initiator > Targets and disconnect old targets
 - c Click OK.
 - d For Windows initiators, connect and discover targets with new IP addresses by clicking **iSCSI Initiator > Targets** and entering new IP addresses.
 - e Click Quick Connect.
 - f Click **OK**.
- 8 From the console of the DAAD target, enter the following command to update the initiators displayed in step 9 to the initiator group:

```
initiator:update -a <initiatorGroup> <newInitiator>
```

Where

initiatorGroup-is the existing initiator group.

newInitiator—is one of the new initiators displayed by the $\tt initiators$ $\tt -dt$ command.

Repeat this step for all the new initiators you want to include in the initiator group.

9 From the command line, enter maintenance off

NOTE: If the initiators do not rediscover the LUNS, run the echo command on the initiator console. The syntax of the commad is

"echo "- - -" > /sys/class/scsi_host/<host0>/scan"

where *hostO* is the host number

Changing MTU settings for iSCSI

To change the MTU of the iSCSI NICs:

- 1 Log in to the DAAD console as user admin.
- 2 Enter maintenance on
- 3 Enter setup lan

The Network Settings screen is displayed.

- 4 Edit the port where you want to change the MTU setting. The Network Card Setup screen is displayed.
- 5 On the Network Card Setup screen, press the left arrow key to select **General**.
- 6 Tab to the Set MTU field.
- 7 Set MTU to the new value.

- 8 Select Next.
- 9 Repeat steps 4-8 for any other iSCSI ports where you want to change the MTU settings.
- 10 Exit the Network Card Setup screen and the Network Setting screen.
- 11 From the command line, enter maintenance off
- 12 Enter ports -dt to ensure the new MTU setting.

HA and host configuration

NOTE: If you are not planning to implement the high-availability feature of the Dell Acceleration Appliance for Databases software, go to Application tuning on page 151.

About DAAD high availability

The Dell Acceleration Appliance for Databases enables a powerful and effective High Availability (HA) environment for your shared storage. HA clustering provides an important option for customers who prefer array-based HA over application-based mirroring. This can be especially useful if your application does not provide logical volume management, such as with all VMware environments and most implementations of Microsoft Clustering.

NOTE: Clustering relies on point-to-point connections. HA networking across geographically distributed sites is not supported.

Figure 9-1 shows both a simple HA clustering setup by using a 40Gb Ethernet connection between appliances and a mirroring configuration without clustering.





Figure 9-2 shows basic LUN access (exported volumes) in an HA configuration.



Figure 9-2. LUN access in HA configurations

In this simplified example, Node 1 presents LUN 0 to the application, while Node 2 presents LUN 1 to the application. All "write" operations to LUN 0 are synchronously replicated to Node 2. All Writes to LUN 1 are synchronously replicated to Node 1. When the replication is complete, the original node acknowledges the write by the application.

Replication occurs over the 40Gb Ethernet interconnect between the two nodes, which consists of two dual-ported ConnectX-3 adapters. In the event a node stops functioning, all data will be available on the remaining active unit.

InfiniBand/SRP and iSCSI connections for HA

Both iSCSI and InfiniBand/SRP systems use dual-port ConnectX-3 cards for cluster interconnections.

For HA systems, the two ports on the interconnect card are split — one port on each of the two ConnectX-3 cards in slot 1 and slot 3 is used for the cluster interconnect, and one is used for the fabric connection. For InfiniBand/SRP systems, two cards in slot 1 and slot 3 are automatically split at boot time by the Dell Acceleration Appliance for Databases software, with the first port being put in InfiniBand mode and the second port being put in Ethernet mode. (Mellanox requires that the first port on a split card be in InfiniBand mode.)

See About DAAD first boot on page 13 for details and dialog boxes regarding cluster setup, and refer to Split-function ports for InfiniBand/SRP and iSCSI on page 164 for details on split-port configuration.

The Dell Acceleration Appliance for Databases does not enforce port-splitting for iSCSI HA configurations (unlike InfiniBand/SRP HA configurations). To ensure maximum availability for HA systems, your iSCSI configurations should split the ports on the two cards in slot 1 and slot 3, using one from each card for the cluster interconnect.

When cabling InfiniBand/SRP HA systems, configure the ports as explained here. The cabling must match the port configurations.



ConnectX-3 card in slot 1 (if HA)

- Port 1: InfiniBand/SRP
- Port 2: Cluster Interconnect

ConnectX-3 card in slot 2

- Port 1: InfiniBand/SRP
- Port 2: InfiniBand/SRP

ConnectX-3 card in slot 3

- Port 1: InfiniBand/SRP
- Port 2: Cluster Interconnect (if HA, otherwise InfiniBand/SRP)

Fabric and cluster interconnect cards

The photos here show common fabric and cluster interconnect cards, with ports labeled. As you configure your Dell Acceleration Appliance for Databases HA system refer to the port locations shownin DAAD configuration on page 163. This will ensure that the optimal port connections are made for a high-performance HA configuration.

Figure 9-3. QLogic QLE2562 Fibre Channel card (Dual-port)



Figure 9-4. ConnectX-3 cluster interconnect card



Multipathing overview

NOTE: For information about managing initiators, such as creating initiator groups, or adding or deleting initiators, refer to the *Dell Acceleration Appliance for Databases GUI Guide* or the *Dell Acceleration Appliance for Databases CLI Reference*.

Supported network fabric and hosts

The Dell Acceleration Appliance for Databases supports Fibre Channel, InfiniBand/SRP, and iSCSI network fabrics for initiators. Refer to the *Dell Acceleration Appliance for Databases Compatibility Guide*, available at dell.com/support/home for complete details on hardware compatibility, multipathing support, and the list of all operating systems supported on the hosts connecting to DAAD.

About multipathing for Windows

Multipath I/O (MPIO) establishes multiple routes and connections to a storage array, by using redundant physical paths (adapters, cables, switches). That way, when a component fails, an alternate I/O path is used. Multipathing provides redundancy of I/O paths and can improve overall system performance.

Before multipathing is installed, you see one drive for each path setup (so with two paths, you see two drives). The Drive Properties dialog box now contains a multipath tab, where you can set the load-balance policy.

To open the Driver Properties dialog box:

- 1 Click Start > Administrative Tools > Computer Management > Device Manager,
- 2 Right-click the disk that you want to add multiple paths to.
- 3 Select Properties.



NOTE: If you are using Fibre Channel, ensure that you have the latest HBA driver installed before configuring multipathing.

Load-balance policies for MPIO

Here are some of the basic load-balance policies typically used with multipathing:

• Round-robin, subsets: Standby paths are used only if all primary paths fail.

NOTE: For Windows MPIO, the "round-robin with subsets" method is required for HA configurations; for Windows standalone configurations, round-robin or dynamic least queue depth methods may be used, with the latter generally preferred.

- Failover: No balancing. Standby paths are used.
- Failback: I/O is rerouted to preferred path when available.
- Round-robin: All available paths are used for balanced I/O.
- Dynamic least queue depth: I/O to path with fewest outstanding requests (in Linux, this is queue-length). This enables multipathing to compensate for an unbalanced load on the fabric. This may be advantageous for standalone configurations.
- Weighted path: Paths are assigned priority weights.

Configuring multipathing on Windows

Installing multipath on windows

When MPIO is installed, the Microsoft device-specific module (DSM) and the MPIO Control Panel are also installed.

For more information about Windows MPIO settings, refer to http://blogs.msdn.com/b/san/archive/2011/12/02/updated-guidance-on-microsoft-mpio-settings.aspx

NOTE: In Windows 2008 R2 SP2, disk I/O operations may fail even when valid failover paths exist. To resolve this issue, apply the Microsoft hotfix available at http://support.microsoft.com/kb/2752538/en-us

Installing MPIO in Windows Server 2008 R2

To add MPIO on a server running Windows Server 2008 R2,

1. Start Server Manager: Start > Administrative Tools > Server Manager

- 2. In the Server Manager tree, click **Features**.
- 3. In the Features section, click Add Features.

4. In the Add Features Wizard, on the Select Features page, select **Multipath I/O**, and then click **Next**.

5. On the Confirm Installation Selections page, click Install.

6. After the installation completes, on the Installation Results page, click Close.

7. When prompted to restart the computer, click **Yes**. After restarting, the computer finalizes the MPIO installation.

8. Click Close.

Installing MPIO in Windows Server 2012 R2

To add MPIO on a server running Windows Server 2012 R2,

1. Start Server Manager: Start > Administrative Tools > Server Manager

- 2. In the Server Manager tree, click **Add roles and Features**.
- 3. Continue in the wizard to the **Select Features** section.
- 4. In the Features window, select Multipath I/O, and then click Next.
- 5. On the Confirm Installation Selections page, click Install.
- 6. After the installation completes, on the Installation Results page, click Close.

7. When prompted to restart the computer, click **Yes**. After restarting, the computer finalizes the MPIO installation.

8. Click Close.

More information is available in the *Microsoft Multipath I/O (MPIO) User's Guide for Windows Server 2012* which is available at http://www.microsoft.com/en-us/download/details.aspx?id=30450.

Configuring multipath on Windows

The MPIO Control Panel enables you to:

- Configure MPIO functionality
- Install additional storage DSMs
- Create MPIO configuration reports

To configure Windows multipathing:

- 1 Click Start > Control Panel > Views list > Large Icons > MPIO.
- 2 On the User Account Control page, click **Continue**. The MPIO Properties dialog box is displayed.
- 3 If you are using iSCSI, click the **Discover Multi-Paths** tab, and ensure that the **Add support for iSCSI devices** is selected.

	MPIO P	roperties	
MPIO Devices	Discover Multi-Paths	DSM Install	Configuration Snapsho
SPC-3 comp	liant		
Device Ha	rdware Id		
Add sup	port for iSCSI devices		
Add sup	port for SAS devices		
			Add
Others			
Device Ha	rdware Id		
			Add
4 Click the **MPIO Devices** tab.

This tab displays the hardware IDs (for example, FUSIONIOION LUN) of the devices managed by MPIO, whenever they are present.

MPIO Properties								
MPIO Devices Discover Multi-Paths DSM Install Configuration Snapshot								
To add support for a new device, click Add and enter the Vendor and Product Ids as a string of 8 characters followed by 16 characters. Multiple Devices can be specified using semi-colon as the delimiter.								
To remove support for currently MPIO'd devices, select the devices and then click Remove.								
Devices:								
Device Hardware Id								
FUSIONIOION LUN								
Vendor 8Product 16								
La								
Add Remove								
More about adding and removing MPIO support								
OK Cancel								

- 5 To add a hardware ID,
 - a Click Add.
 - b Type the hardware ID, which is Vendor ID (eight characters), and type the Product ID (16 characters).
 - c Click **OK**.
- 6 Click **OK**.
- 7 Click Storage >Server Manager >Disk Management.

8 Right-click the DAAD LUN to view its properties.

USIONIO ION LON Pluiti-Path Disk Device Properties						
General Policie	s Volumes MPIO	Driver	Details			
Select the MPIC) policy: Round	Robin Wi	ith Subset	•		
Description -						
The round robin with subset policy executes the round robin policy only on paths designated as active/optimized. The non-active/optimized paths will be tried on a round-robin approach upon failure of all active/optimized paths.						
DSM Name:	Microsoft DSM	I	[Details		
This device has	the following paths:					
Path Id	Path State	TPG	TPG State	Wei. 🔺		
77060006	Active/Optimi	257	Active/Optin	ni		
77060007	Active/Optimi	257	Active/Optin	ni		
77050006	Active/Optimi	257	Active/Optin	ni 🔽		
•		017	•			
To edit the path settings for the MPIO policy, select a Edit						
To apply the path settings and selected MPIO policy.						
More information about MPIO policies						
			ок	Cancel		

9 Click **MPIO Policy** on the MPIO tab, ensure that **Round Robin With Subset** is selected.

10 Click **Details** to view the DSM Details dialog box.

DSM Name	Microsoft D	SM	
Join Name:	Improspered	I	
OSM Version:	6.1.7601.1	7965	
DSM Context:	fffffa8031	3c45b0	
Timer Counters			
niner counters			
Path Verify Period:	10	Path Verify B	inabled
Retry Count:	3	Retry Interval:	1
PDO Remove Period	: 45		
More information ab	out DSM detai	<u>ls</u>]

11 Ensure that the **Path Verify Enabled** check box is selected.

12 Click **OK** to close each dialog box, until prompted to restart the system.

'10 Properties	×	
ADIO Devices Discover Multi-Paths Inc	Reboot Required	R
SPC-3 compliant Device Hardware Id	A reboot is required to complete the operation. Reboot Now?	
Add support for ISCSI devices	Yes No	1.45
Others		

- 13 If you are running in standalone mode, click **Yes** to restart, and then go to Discovering multipaths on page 112.
- 14 If you are running in HA mode, click **No** at the reboot prompt, as there more tasks to be completed.

15 Use regedit to edit the Registry with the following changes:

```
HKLM\SYSTEM\CurrentControlSet\services
\Disk\TimeOutValue = 60 secs
\mpio\Parameters\UseCustomPathRecoveryInterval = 1
```

NOTE: If you are using Fibre Channel, use the 30-second interval shown below; if you are using iSCSI, set the interval to 5:

```
\mpio\Parameters\PathRecoveryInterval = 30 secs
```

16 For the QLogic 25xx HBA (Fibre Channel), make the following changes in the driver, by using the QLogic CLI or GUI in Windows:

QLogic Port Link/Down Timeout = 15 secs QLogic Port Retry/Down Timeout = 15 secs Or if you are using Emulex drivers with Fibre Channel, make the following changes:

Emulex LinkTimeout = 15 secs Emulex NodeTimeout = 60 secs

17 Restart the Windows system.

Discovering multipaths

To discover multipaths that exist in your configuration:

- 1 Ensure that multiple instances represent the same Logical Unit Number (LUN) through different paths. Hardware IDs for those devices are displayed for use with MPIO.
- 2 Add a second initiator to a volume.
- 3 With multipath running, open a disk management tool, such as Windows Disk Manager.
- 4 View the volume from the initiator and ensure that only one volume shows up. (Before installing multipath, the volume would show up twice).

Configuring iSCSI initiators for Windows

The instructions in this section apply to multipathing for Windows Server 2008 R2 and Windows Server 2012.

NOTE: Each initiator iSCSI port should be in a separate subnet that is the same as that of the target iSCSI port.

NOTE: Ensure that the default port 3260 for iSCSI is not blocked by a firewall.

Standalone mode

- 1 Ensure that the following Windows hot fix module and settings are applied: http://support.microsoft.com/kb/2752538/en-us
- 2 Use regedit to disable the delayed ACK in the registry:

HKLM\SYSTEM\CurrentControlSet\Services\Tcpip\Parameters\Interfaces\<Interfac e GUID>\TcpAckFrequency = 1

To create this registry setting:

- a Right-click in the interface you are using for iSCSI.
- b Select a new DWORD 32-bit value.
- c Name the new value TcpAckFrequency.
- d Set the value to 1.
- 3 Increase the reconnect retries value in the registry as follows:

```
HKLM\SYSTEM\CurrentControlSet\Control\Class\{4D36E97B-E325-11CE-BFC1-
08002BE10318}\<Instance Number>\Parameters\PortalRetryCount = fffffff
```

4 Set the registry values and restart the system.

HA mode

- 1 Complete the tasks 1 through 3 in the procedure for Standalone mode on page 113.
- 2 Click Control Panel > MPIO > Add Device Hardware ID.
- 3 Specify the device as **FUSIONIOION LUN**.
- 4 Use regedit to set the timeout value to 60 seconds:

HKLM\SYSTEM\CurrentControlSet\services\Disk\TimeOutValue = 60 secs

5 Use regedit to set the custom path recovery interval to 1:

HKLM\SYSTEM\CurrentControlSet\services\mpio\Parameters\UseCustomPathRecovery
Interval = 1

6 Use regedit to set the path recovery interval to 5 seconds:

HKLM\SYSTEM\CurrentControlSet\services\mpio\Parameters\PathRecoveryInterval
= 5 secs

7 Set the registry values and restart the system.

Setting up iSCSI in Windows

For the example used in this configuration, the following items must be noted:

- The Windows 2008 R2 initiator has an iSCSI card that uses IP addresses 192.168.10.125 and 192.168.11.125.
- The target is the Dell Acceleration Appliance for Databases in HA mode. Each node has a card installed and configured for iSCSI. The IP addresses are 192.168.10.8 and 192.168.11.8 for the first node, and 192.168.10.9 and 192.168.11.9 for the second node.
- The Dell Acceleration Appliance for Databases volume of 100 GB is used, with LUNs already created and presented to the Windows initiator.

To set up iSCSI in Windows:

- 1 Click Start > Administrator Tools > iSCSI Initiator.
- 2 Log in to each target port and click **Quick Connect**.

i9	iSCSI Initiator Properties							
	Targets Quick C To disc DNS no	Discovery Connect Cover and le ame of the	Favorite Targets	Volumes and Devic	es RADIU n, type the	IS Configuration		
	Target	19	2.168.10.8			Quick Connect		
	Discove	ered target	s			Refresh		

After you successfully log in to all four targets, the discovered targets are displayed.

Discovered Targets (Targets Tab)

CSI Initiator Properties	
Targets Discovery Favorite Targets Volumes and Devic	ces RADIUS Configuration
Quick Connect	
To discover and log on to a target using a basic connection DNS name of the target and then click Quick Connect.	n, type the IP address or
Target:	Quick Connect
Discovered targets	
	Refresh
Name	Status
ign.2007-02.com.fusionio:sn.2m232406fv:eth4	Connected
iqn.2007-02.com.fusionio:sn.2m232406fv:eth5	Connected
iqn.2007-02.com.fusionio:sn.2m232406fw:eth6	Connected
iqn.2007-02.com.fusionio:sn.2m232406fw:eth7	Connected

Target Portals (Discovery Tab)

5I Initi	ator Prope	rties		
argets	Discovery	Favorite Targets	Volumes and Devices	RADIUS Configuration
Target	portals			
The s	ystem will loo	ok for Targets on fo	blowing portals:	Refresh
Addre	ess	Port	Adapter	IP address
192.1	168.10.8	3260	Default	Default
192.1	168.10.9	3260	Default	Default
192.1	168.11.8	3260	Default	Default
192.1	168.11.9	3260	Default	Default
To ad	d a target p	ortal, click Discover	Portal.	Discover Portal
To rer then (nove a targe click Remove	et portal, select the	e address above and	Remove

Favorite Targets Tab

LSI Initiator Prope	rties			
argets Discovery	Favorite Targets	Volumes and Devices	RADIUS	Configuration
The iSCSI initiator se available, An attem time this computer re	rvice ensures that ot to restore conne estarts.	all volumes and devices ctions to targets listed h	on a favor here will be	rite target are • made every
Fo add a target to th the list of Favorite T	nis list you must use argets" or use the '	e the default selection o "Quick Connect" option.	f "Add this	connection to
Favorite targets:				Refresh
Name				
iqn.2007-02.com.f	usionio:sn.2m2324	06fv:eth4		
ign.2007-02.com.f	usionio:sn.2m2324	06fv:eth5		
iqn.2007-02.com.f	usionio:sn.2m2324	O6fw:eth6		
ian.2007-02.com.f	usionio:sn.2m2324	06fw:eth7		

3 To view the LUN discovery in Server Manager, open the **Disk Management** volume list. Disk 1 in the example here shows the discovered volume formatted and partitioned as drive E:

📕 Server Manager					
File Action View Help					
🗢 🔿 🖄 📅 🚺 🖬 🖄 🖆	7 😼				
Server Manager (WIN-6SCUT6F0L5	Disk Managemen	t Volum	e List +	Graphical Viev	v
	Volume	Layout	Туре	File System	Status
	🗀 (C:)	Simple	Basic	NTFS	Healthy (Boot, Page File, Crash Dump, Primary
Event Viewer	New Volume (E:)	Simple	Basic	NTFS	Healthy (Primary Partition)
	📼 System Reserved	Simple	Basic	NTFS	Healthy (System, Active, Primary Partition)
🕌 Device Manager					
🕀 🁬 Configuration					
🖃 🚰 Storage					
🕀 🚟 Storage Manager for SANs	Dick 0				A
Windows Server Backup	Basic	System	Reser	y (C:)	
🚔 Disk Management	149.01 GB	100 MB N	ITFS	148.91 G	BNTFS
	Online	Healthy (System	, Healthy (Boot, Page File, Crash Dump, Primary Parti
		1			
	Disk 1				

4 To see the discovered LUN as an MPIO multipath configuration disk device, with two active and two standby paths, right-click Disk 1 and click **Properties**.

USIONIO ION LUN Multi-Path Disk Device Properties 🛛 🛛 🗙								
General Policies	Volumes MPIO	Driver	Details					
Select the MPIO p	Select the MPIO policy: Round Robin With Subset							
Description								
The round robin with subset policy executes the round robin policy only on paths designated as active/optimized. The non-active/optimized paths will be tried on a round-robin approach upon failure of all active/optimized paths.								
DSM Name: M	icrosoft DSM			D	etails			
This device has th	ne following paths:							
Path Id	Path State	TPG	TPG State		Wei			
77030001	Standby	2305	Standby					
77030003	Standby	2305	Standby					
77030000	Active/Optimi	2049	Active/Optir	mi				
77030002	Active/Optimi	2049	Active/Optir	mi				
To edit the path settings for the MPIO policy, select a Edit To apply the path settings and selected MPIO policy, Apply More information about MPIO policies								
			OK		Cancel			

Creating Windows initiators in DAAD

1 From DAAD (Stand-Alone or HA), create an initiator group:

```
inigroup:create W2K8
Id W2K8
Parent
Initiators []
UUID 79f7b844-5bbf-11e3-acce-0015178fbc10
```

2 For each target, create an initiator. The examples below are for four iSCSI targets in the Dell Acceleration Appliance for Databases HA:

```
initiator:create -a W2K8 ign.1991-05.com.sga.microsoft:win-
ru3kmomq0ov#192.168.10.8 win_1
id win_1
UUID iqn.1991-05.com.sqa.microsoft:win-ru3kmomq0ov#192.168.10.8
Protocol iSCSI
Discovered false
Initiator Group 79f7b844-5bbf-11e3-acce-0015178fbc10
initiator:create -a W2K8 iqn.1991-05.com.sqa.microsoft:win-
ru3kmomq0ov#192.168.11.8 win_2
id win 2
UUID iqn.1991-05.com.sqa.microsoft:win-ru3kmomq0ov#192.168.11.8
Protocol iSCSI
Discovered false
Initiator Group 79f7b844-5bbf-11e3-acce-0015178fbc10
initiator:create -a W2K8 iqn.1991-05.com.sqa.microsoft:win-
ru3kmomq0ov#192.168.10.9 win_3
id win_3
UUID iqn.1991-05.com.sqa.microsoft:win-ru3kmomq0ov#192.168.10.9
Protocol iSCSI
Discovered false
Initiator Group 79f7b844-5bbf-11e3-acce-0015178fbc10
admin@ionr8i48/> initiator:create -a W2K8 ign.1991-
05.com.sqa.microsoft:win-ru3kmomq0ov#192.168.10.9 win_4
id win_4
UUID iqn.1991-05.com.sqa.microsoft:win-ru3kmomq0ov#192.168.11.9
Protocol iSCSI
Discovered false
Initiator Group 79f7b844-5bbf-11e3-acce-0015178fbc10
```

Configuring multipathing on Linux

Installing MPIO on Linux

The basic components for Linux multipathing are:

- dm_multipath kernel module Reroutes I/O, supports failover for paths & path groups.
- mpathconf utility Configures and enables device mapper multipathing
- multipath command Lists & configures multipath devices. Start with /etc/rc.sysinit or udev when a block device is added.
- multipathd daemon Monitors paths; as paths fail and come back, it may initiate path group switches. Provides for interactive changes to multipath devices. This must be restarted for any changes to the /etc/multipath.conf file
- kpartx command Creates device mapper devices for the partitions on a device.
 Use this command for DOS-based partitions with DM-MP. The kpartx is provided in
 its own package, but the device mapper-multipath package depends on it.

For specific installation information about Oracle Linux 6.4 and RHEL 6.4+ see the MPIO installation sections later in this guide.

The basic steps for installing DM Multipath are listed here:

- 1 Install device-mapper-multipath RPM.
- 2 On OL 6.4 or RHEL, run mpathconf --enable to enable multipathing.
- 3 If necessary, edit the multipath.conf configuration file to modify default values and save the updated file.
- 4 Start the multipath daemon.

Common mpathconf settings

Here are some common multipathing configuration settings:

```
mpathconf --find_multipaths y
mpathconf --with_module y
mpathconf --with_module y
```

Configuring multipathing in HA mode

To configure multipathing on the host node in the Dell Acceleration Appliance for Databases HA environment, use the multipath.conf file:

NOTE: These instructions apply to OL 6.4 and RHEL 6.4 and later.

- 1 Complete the tasks in the first line of the code about copying the file.
- 2 Follow the uncomment instructions near the end of the file.

3 Restart multipathd as indicated on the first line of the multipath.conf file: # copy this file to /etc/multipath.conf and restart multipathd

```
defaults {
  user_friendly_names
                           yes
  queue_without_daemon
                           no
}
devices {
  device {
           vendor
                                   "FUSIONIO"
           features
                       "3 queue_if_no_path pg_init_retries 50"
                                   "1 alua"
           hardware_handler
           path_grouping_policy
                                   group_by_prio
           path_selector
                                   "queue-length 0"
           failback
                                   immediate
           path_checker
                                   tur
           prio
                                   alua
      # Uncomment if using FC. Do not use for SRP and iSCSI
                             15
      #fast_io_fail_tmo
      #dev_loss_tmo
                              60
  }
}
```

Configuring standalone multipathing with host-based mirroring

To configure multipathing with RAID/LVM/ASM (host-based mirroring) in a standalone Dell Acceleration Appliance for Databases environment, use the multipath.conf file:

NOTE: These instructions apply to OL 6.4 and RHEL 6.4 and later.

- 1 Complete the tasks in the first line about copying the file.
- 2 Follow the uncomment instructions at the end of the file.

3 Restart multipathd as indicated on the first line.

```
# copy this file to /etc/multipath.conf and restart multipathd
```

```
defaults {
  user_friendly_names
                           yes
  queue_without_daemon
                           no
}
devices {
  device {
           vendor
                                   "FUSIONIO"
           features
                                   "0"
           hardware_handler
                                   "1 alua"
           path_grouping_policy
                                   group_by_prio
           path_selector
                                   "queue-length 0"
           failback
                                   immediate
           path_checker
                                   tur
           prio
                                   alua
           no_path_retry
                                   3
           # Uncomment if using FC. Do not use for SRP and iSCSI
           #fast_io_fail_tmo
                                   15
           #dev_loss_tmo
                                   60
  }
}
```

Configuring multipathing for Oracle VM Server

To configure multipathing to run on Oracle VM Server, add a device entry in the multipath.conf file. Near the bottom of the multipath.conf file, in the devices section append the following lines:

dev	vice {	
	vendor	"FUSIONIO"
	features	"3 queue_if_no_path pg_init_retries 50"
	hardware_handler	"1 alua"
	path_grouping_policy	group_by_prio
	path_selector	"queue-length 0"
	failback	immediate
	path_checker	tur
	prio	alua
	# Uncomment if using FC.	. Do not use for SRP and iSCSI
	#fast_io_fail_tmo	15
	#dev_loss_tmo	60
	} \	

NOTE: Ensure that the closing bracket "}" for the devices section follows the closing bracket of the section you just added.

Restarting multipathing

If your multipath configuration changes, you may need to restart multipathing, as in this example:

```
# multipathd -k
multipathd> reconfigure
ok
multipathd> show config
multipathd> exit
```

When using the show config command, search through the output and ensure that it matches what was entered in /etc/multipath.conf.

If the restart is not successful, you can try running the following commands:

```
# multipath -F
# service multipathd stop
# service multipathd start
// confirm the new settings are used for existing multipath devices
# multipath -11
(See Creating RHEL initiators for DAAD on page 124 for sample multipath -11 output.)
```

Setting the node session timeout for iSCSI

If you are using the iSCSI protocol, you need to set the node.session.timeo.replacement_timeout value. This should be done for both HA and standalone systems.

NOTE: This should not be done while applications are using the iSCSI or dmmultipath devices.

The node.session.timeo.replacement_timeout setting controls the time a path is tried before it is failed. When using dm-multipath, a value of 15 seconds is safe. If your applications require faster failovers, you may need to set the value lower, such as to 5 seconds.

To set this value so it can be used for both current and new sessions:

- 1 Edit the /etc/iscsid.conf file and set an appropriate value for node.session.timeo.replacement_timeout.
- 2 Log out of current sessions by running iscsiadm -m session -u.
- 3 Set the replacement timeout for currently discovered portals, as follows:

is csiadm -m node -o update -n node.session.timeo.replacement_timeout -v 15 $\,$

4 Log in to the targets again:

iscsiadm -m node -T target -p IP -l

Linux SCSI initiator notes

When using Linux SCSI initiators with the Dell Acceleration Appliance for Databases consider the following:

- The SCSI H:C:I:L address assigned by a Linux initiator system consists of four components: Host, Channel, Target ID, and LUN. Of these components, only the LUN number is assigned by the Dell Acceleration Appliance for Databases system. The other three components are assigned by the initiator system.
- An HBA reset (caused by the host being reset or the sg_reset command being run) can cause the first three components of an H:C:I:L address to change.
- An HBA reset can cause a new /dev/sd* device node to be assigned to a path.
- A LUN rescan initiated by the rescan-scsi-bus.sh script changes neither the H:C:I:L SCSI address nor the /dev/sd* device node assigned to a path.

Setting up Linux iSCSI initiators

For the example used in this configuration, the following items must be noted:

- The Red Hat Linux initiator has an iSCSI card that uses IP addresses 192.168.10.119 and 192.168.11.119.
- The target is the Dell Acceleration Appliance for Databases in HA mode. Each node has a card installed and configured for iSCSI. The IP addresses are 192.168.10.8 and 192.168.11.8 for the first node, and 192.168.10.9 and 192.168.11.9 for the second node.
- The Dell Acceleration Appliance for Databases volume of 100GB is used, with LUNs already created and presented to the Linux initiator.

NOTE: Each initiator iSCSI port should be in a separate subnet that is the same as that of the target iSCSI port.

Discovering DAAD volume

By running the targets command in the CLI, you can view the targets as seen from the HA side of the Dell Acceleration Appliance for Databases system.

Discovering DAAD target portals from RHEL initiators

To see all the target portals that are discovered, you can run the $\tt iscsiadm$ command at the CLI:

```
# iscsiadm -m discovery -t st -p 192.168.10.8
192.168.10.8:3260,1 iqn.2007-02.com.fusionio:sn.2m232406fv:eth4
# iscsiadm -m discovery -t st -p 192.168.10.9
1 92.168.10.9:3260,1 iqn.2007-02.com.fusionio:sn.2m232406fw:eth6
# iscsiadm -m discovery -t st -p 192.168.11.8
192.168.11.8:3260,1 iqn.2007-02.com.fusionio:sn.2m232406fv:eth5
# iscsiadm -m discovery -t st -p 192.168.11.9
192.168.11.9:3260,1 iqn.2007-02.com.fusionio:sn.2m232406fw:eth7
```

```
# iscsiadm -m node -P1
Target: ign.2007-02.com.fusionio:sn.2m232406fw:eth6
        Portal: 192.168.10.9:3260,1
                Iface Name: default
Target: ign.2007-02.com.fusionio:sn.2m232406fw:eth7
        Portal: 192.168.11.9:3260,1
                Iface Name: default
Target: ign.2007-02.com.fusionio:sn.2m232406fv:eth5
        Portal: 192.168.11.8:3260,1
                Iface Name: default
Target: ign.2007-02.com.fusionio:sn.2m232406fv:eth4
        Portal: 192.168.10.8:3260,1
                Iface Name: default
The following example logs in to each target portal:
# iscsiadm -m node -T iqn.2007-02.com.fusionio:sn.2m232406fw:eth6 -p
192.168.10.9 -1
# iscsiadm -m node -T iqn.2007-02.com.fusionio:sn.2m232406fw:eth7 -p
192.168.11.9 -1
# iscsiadm -m node -T iqn.2007-02.com.fusionio:sn.2m232406fv:eth5 -p
192.168.11.8 -1
# iscsiadm -m node -T iqn.2007-02.com.fusionio:sn.2m232406fv:eth4 -p
192.168.10.8 -1
# iscsiadm -m session
tcp: [5] 192.168.10.9:3260,1 iqn.2007-02.com.fusionio:sn.2m232406fw:eth6
tcp: [6] 192.168.11.9:3260,1 iqn.2007-02.com.fusionio:sn.2m232406fw:eth7
tcp: [7] 192.168.11.8:3260,1 iqn.2007-02.com.fusionio:sn.2m232406fv:eth5
tcp: [8] 192.168.10.8:3260,1 iqn.2007-02.com.fusionio:sn.2m232406fv:eth4
```

Creating RHEL initiators for DAAD

1 At the CLI, run the following to create an initiator group:

```
inigroup:create RHEL
Id RHEL
Parent
Initiators []
UUID 29f1007e-1751-11e3-8482-0015178fbc10
```

2 For each target, create an initiator. The examples here are for four iSCSI targets from the Dell Acceleration Appliance for Databases HA:

```
initiator:create -a RHEL iqn.1994-05.com.redhat:595862111da4#192.168.10.8
rhel_1
id rhel_1
UUID iqn.1994-05.com.redhat:595862111da4#192.168.10.8
```

```
Protocol iSCSI
Discovered false
Initiator Group 29f1007e-1751-11e3-8482-0015178fbc10
initiator:create -a RHEL iqn.1994-05.com.redhat:595862111da4#192.168.11.8
rhel_2
id rhel 2
UUID ign.1994-05.com.redhat:595862111da4#192.168.11.8
Protocol iSCSI
Discovered false
Initiator Group 29f1007e-1751-11e3-8482-0015178fbc10
initiator:create -a RHEL iqn.1994-05.com.redhat:595862111da4#192.168.10.9
rhel_3
id rhel_3
UUID ign.1994-05.com.redhat:595862111da4#192.168.10.9
Protocol iSCSI
Discovered false
Initiator Group 29f1007e-1751-11e3-8482-0015178fbc10
initiator:create -a RHEL ign.1994-05.com.redhat:595862111da4#192.168.11.9
rhel_4
id rhel_4
UUID ign.1994-05.com.redhat:595862111da4#192.168.11.9
Protocol iSCSI
Discovered false
Initiator Group 29f1007e-1751-11e3-8482-0015178fbc10
```

The DAAD LUN is now discovered with a MPIO multi-path configuration disk device, with two active and two enabled paths:

```
# multipath -11
mpathag (26538623635336336) dm-3 FUSIONIO,ION LUN
size=93G features='3 queue_if_no_path pg_init_retries 50' hwhandler='1 alua'
wp=rw
|-+- policy='queue-length 0' prio=130 status=active
| |- 11:0:0:0 sdd 8:48 active ready running
| `- 12:0:0:0 sde 8:64 active ready running
`-+- policy='queue-length 0' prio=1 status=enabled
|- 9:0:0:0 sdb 8:16 active ready running
`- 10:0:0:0 sdc 8:32 active ready running
```

Utilizing full bandwidth of a 10 Gbs Ethernet link

To utilize the full bandwidth of a 10 Gbs Ethernet link, the iSCSI protocol requires you to set up multiple sessions. Follow these steps to set up multiple sessions:

- 1 Configure /etc/multipath.conf so that multipathd controls at least two iSCSI LUNs.
- 2 Start multipathd.
- 3 Change the parameter node.session.nr_sessions in /etc/iscsid.conf from 1 to 4.
- 4 Trigger an iSCSI logout and login.
- 5 Verify the multipath -11 output and look up which /dev/dm-<n> node corresponds with which iSCSI LUN.
- 6 Use the /dev/dm-<n> device nodes for communication over iSCSI with the ION system.

Mounting a file system on a LUN during boot

In order to mount a file system on top of the Dell Acceleration Appliance for Databases LUN during Linux system boot time, complete the following tasks:

1 Determine the SCSI ID of the Dell Acceleration Appliance for Databases LUN. This is the number shown between parentheses in the output of multipath -I that starts with the digit 2. For example:

```
# multipath -1
26164613638323832 dm-0 FUSIONIO,ION LUN
size=34G features='3 queue_if_no_path pg_init_retries 50' hwhandler='0' wp=
rw
`-+- policy='queue-length 0' prio=0 status=active
`- 17:0:0:0 sdc 8:32 active undef running
23630313437393135 dm-1 FUSIONIO,ION LUN
size=31G features='3 queue_if_no_path pg_init_retries 50' hwhandler='0' wp=
rw
`-+- policy='queue-length 0' prio=0 status=active
`- 17:0:0:1 sdd 8:48 active undef running
```

2 Add an entry in /etc/fstab for that LUN and use the noauto option so the entry is skipped during boot time. For example:

/dev/disk/by-id/dm-uuid-mpath-23165353937623137 /mnt auto noauto 0 0

- 3 Add a script in /etc/init.d that waits until multipathd has detected the LUN and then mounts the filesystem. See Script for Mounting the file system on page 127.
- 4 Make the system run during startup and shutdown. For example:

chkconfig mount-ion-filesystems on

Script for Mounting the file system

```
#!/bin/sh
### BEGIN INIT INFO
# Provides: mount-ion-filesystems
# Required-Start: multipathd
# Required-Stop: multipathd
# Default-Start: 2 3 4 5
# Default-Stop: 0 1 6
# Description: Mount ION File Systems
### END INIT INFO
### BEGIN CHKCONFIG INFO
# chkconfig: 2345 13 87
# description: Mount ION File Systems
### END CHKCONFIG INFO
timeout=120
usage() {
echo
```

```
echo "Usage: `basename $0` {start|stop|restart|status}"
echo
return 2
}
is_ion_lun() {
[ "${1#/dev/disk/by-id/dm-uuid-mpath-}" != "$1" ]
}
luns_exist() {
grep -v '^#' /etc/fstab |
while read dev mountpoint vfstype options freq passno; do
is_ion_lun "$dev" && [ ! -e "$dev" ] && return 1
done
return 0
}
mount_luns() {
grep -v '^#' /etc/fstab |
while read dev mountpoint vfstype options freq passno; do
is_ion_lun "$dev" && fsck -n "$dev" && mount "$dev"
done
}
unmount_luns() {
grep -v '^#' /etc/fstab |
while read dev mountpoint vfstype options freq passno; do
is_ion_lun "$dev" && umount "$dev"
done
}
start() {
for i in $(seq $timeout); do
luns_exist && break
sleep 1
done
mount_luns
}
stop() {
unmount_luns
}
case "$1" in
start) start;;
stop) stop;;
restart) stop; start;;
status) ;;
*) usage;;
esac
```

Configuring DAAD with ESXi initiators

The following sections describe how to configure ESXi initiators to work with DAAD.

Configuration procedure: Mixed sub-storage

This section explains how to set up ESXi 5.1 and ESXi 5.5 initiators to work with the Dell Acceleration Appliance for Databases, if your system has other storage subsystems that do not allow MPIO to run in Round-Robin mode.

NOTE: If your only storage system is Dell Acceleration Appliance for Databases, skip to *Configuration Procedure: ION Accelerator Only*.

To change the MPIO policy for each ESX LUN (DataStore) in the system:

- 1 Select the ESXi host you want to modify and click the **Manage** tab at the upperright corrner.
- 2 Click Storage > Storage Devices and click the LUN you want to modify.
- 3 In the Properties pane, click **Edit Multipathing** to obtain the paths that are in use.
- 4 Under the Policy section, select **Round Robin** from the drop-down menu.
- 5 Click **Change** to apply the change in path policy.
- 6 Click **OK** to close the dialog box
- 7 Repeat steps 2-6 for each LUN.

Complete the configuration by performing the steps found in Completing the configuration on page 130.

Configuration procedure: DAAD only

This section describes the tasks to set up ESXi 5.1 and ESXi 5.5 initiators to work with the Dell Acceleration Appliance for Databases if it is the only storage subsystem.

1 Before presenting DAAD volumes to the ESXi initiator, set a storage global policy on each ESXi initiator in-use by running the following command. This ensures that the default path policy for ALUA based storage is set to Round-Robin.

```
~ # esxcli storage nmp satp set --default-psp=VMW_PSP_RR
--satp=VMW_SATP_ALUA
```

The default PSP for VMW_SATP_ALUA is now VMW_PSP_RR.

2 Restart the ESXI initiators for the policy to take effect.

3 Ensure the settings by running the following command:

~ # esxcli storage nmp satp list

Completing the configuration

Following the recommendations in the *Setting Up Storage* section in the *Dell Acceleration Appliance for Databases GUI Guide*, create the storage profile, volumes, and initiator groups. The initiators will come from ESXi hosts.

1 Present the volumes to the initiator group.

NOTE: Dell recommends that all the initiators from each of the ESXi cluster nodes are part of one Initiator Group. Also, users can dynamically add initiators to an already existing initiator group. This results in the newly added initiators gaining access to the volume(s).

After the configuration is complete on the Dell Acceleration Appliance for Databases appliance and the volumes are presented to the ESXi nodes, you need to run a rescan to discover the FUSIONIO volumes.

- 2 In the vSphere GUI, log in to an ESXi host.
- 3 Click ESXi Host > Configuration > Storage Adapters.
- 4 Select the initiator .
- 5 Right-click the initiator (vmhba), and then click **Rescan**.
- Configuration Tasks & Events Alarms Permissions Maps Storage Views Hardware Status

Storage Adapters							
Device		Туре	WWN				
Pats	burg 6 Port SATA AHCI Contr	oller					
0	vmhba0	Block SCSI					
0	vmhba32	Block SCSI					
0	vmhba33	Block SCSI					
0	👌 vmhba34 Block SCSI						
0	vmhba35						
0	vmhba36	Block SCSI					
ISP2	532-based 8Gb Fibre Channe	l to PCI Express H	BA				
0	vmhba2	Fibre Channel	20:00:0 <mark>0:24:</mark> £	f=6c=ca+d0.21+00+00+2	4:ff:6c:ca:dD		
6	vmhba3	Fibre Channel	20:00:0	Rescan	4:ff:6c:ca:d1		
0	vmhba4	Fibre Channel	20:00:0	Properties	4:ff:6c:ca:d2		
0	vmhba5	Fibre Channel	20:00:0	Remove	4:ff:6c:ca:d3		
Sma	rt Array P420i			Komoro]		
0	vmhba1	Block SCSI		\searrow			

TI	FLICI				D - + - ! -			C f:	· · · · · · · · · · · · · · · · · · ·	
Ind		dicke now	annaar	IN THA		COCTION	OT THO	CONTINI	iration	cordon
	1 0 31	UI3K3 110W	appear		Details	SECTION		COLING	ilation	3010011

Configuration Tasks & Events	Alarms Permission	s Maps Storage Views Hardware Status							
itorage Adapters						A	dd Remove	Refresh R	escan All
Device	Туре	WWN							
atsburg 4 port SATA IDE Control	ller								
👌 vmhba0	Block SCSI								
ymhba32	Block SCSI								
P2532-based 8Gb Fibre Channe	l to PCI Express I	IBA							
) vmhba2	Fibre Channel	20:00:00:24:ff:66:a1:e8:21:00:00:24:ff:66:a1:e8							
ymhba3	Fibre Channel	20:00:00:24:ff:66:a1:e9:21:00:00:24:ff:66:a1:e9							
) vmhba4	Fibre Channel	20:00:00:24:ff:66:a1:ea 21:00:00:24:ff:66:a1:ea							
) vmhba5	Fibre Channel	20:00:00:24:ff:66:a1:eb 21:00:00:24:ff:66:a1:eb							
nart Array P420i									
) vmhba1	Block SCSI	.0							
tails vmhba3 Model: ISP2532-based 8Gb Fili	bre Channel to PCI E	Express HBA							
Taxaaba d Daviseer	12 Date	p:d1:69							
Targets. + Devices.	13 Paths	: 20							
iew: Devices Paths									
Vame		∧ Identifier	Runtime Name	Operational State	LUN	Туре	Drive Type	Transport	-
FUSIONIO Fibre Channel Disk (dot2	2_rdm_v2)	eul.3234336533666530	vmhba2:C0:T0:L3	Mounted	3	disk	Non-SSD	Fibre Chann	el
FUSIONIO Fibre Channel Disk (dot2	2_vmfs_v1)	eui.3863633861383765	vmhba2:C0:T0:L1	Mounted	1	disk	Non-SSD	Fibre Chann	el
FUSIONIO Fibre Channel Disk (eui.3	3138613234306136	eui.3138613234306136	vmhba2:C0:T0:L11	Mounted	11	disk	Non-SSD	Fibre Chann	el
FUSIONIO Fibre Channel Disk (eui.3	3237373436663132	eui.3237373436663132	vmhba2:C0:T0:L12	Mounted	12	disk	Non-SSD	Fibre Chann	el
FUSIONIO Fibre Channel Disk (eui.3	3438373932363533)	eui.3438373932363533	vmhba2:C0:T0:L10	Mounted	9	disk	Non-SSD	Fibre Chann	el
FUSIONIO Fibre Channel Disk (eui.6	5131656664666130)	eui.6131656664666130	vmhba2:C0:T0:L2	Mounted	2	disk	Non-SSD	Fibre Chann	el
FUSIONIO Fibre Channel Disk (eui.6	5337346362653239	eui.6337346362653239	vmhba2:C0:T0:L13	Mounted	13	disk	Non-SSD	Fibre Chann	el 🚬
0									+ I

- 6 Repeat this procedure (steps 5-7) for all HBAs.
- 7 When the FUSIONIO volumes are discovered, ensure that the path policy is set to **Round Robin**.

- line -				
olicy				
Path Selection:	Round Robin (VMware)		•	Change
Storage Array T	/pe: VMW_SATP_ALUA			
aths				
Runtime Name	Target	LUN	Status F	Preferred
vmhba3:C0:T1:L:	1 20:00:00:24:ff:67:29:7d 21:00:00:24:ff:67:29:7d	11	Stand by	
vmhba3:C0:T0:L:	1 20:00:00:24:ff:67:29:7c 21:00:00:24:ff:67:29:7c	11	Stand by	
vmhba2:C0:T1:L:	1 20:00:00:24:ff:67:5f:61 21:00:00:24:ff:67:5f:61	11	 Active (I/O) 	
vmhba2:C0:T0:L:	1 20:00:00:24:ff:67:5f:60 21:00:00:24:ff:67:5f:60	11	Active (I/O)	
				Refresh
Name:	fc.20000024ff66a1e9;21000024ff66a1e9-fc.20000024ff67	2974:2100002	4ff67297d-eui,313861323	Refresh
Name: Suntime Name:	fc.20000024ff66a1e9:21000024ff66a1e9-fc.20000024ff677	297d:2100002	24ff67297d-eui.313861323	Refresh 34306136
Name: Runtime Name:	fc.20000024ff66a1e9:21000024ff66a1e9-fc.20000024ff677 vmhba3:C0:T1:L11	297d:2100002	24ff67297d-eui.313861323	Refresh
Name: Runtime Name: Fibre Channel	fc.20000024ff66s1e9:21000024ff66s1e9-fc.20000024ff673 vmbba3:C0:T1:L11	297d:2100002	4ff67297d-eui.313861323	
Name: Runtime Name: Fibre Channe l Adapter:	fc.20000024ff66a1e9:21000024ff66a1e9-fc.20000024ff677 vmbba3:C0:T1:L11 20:00:00:24:ff66:a1:e9.21:00:00:24:ff:66:a1:e9	297d:2100002	4ff67297d-eui.313861323	Refresh
Name: Runtime Name: Fibre Channel Adapter: Target:	fc.20000024ff66a1e9:21000024ff66a1e9-fc.20000024ff67 ymbba3:C0:T1:L11 20:00:00:24:ff.66:a1:e9 20:00:00:24:ff.66:a1:e9 20:00:00:24:ff.66:a1:e9	297d:2100002	24ff67297d-eui.313861323	
Name: Runtime Name: Fibre Channel Adapter: Target:	fc.20000024ff66a1e9:21000024ff66a1e9-fc.20000024ff677 vmbba3:C0:T1:L11 20:00:00:24:ff166:a1:e9 21:00:00:24:ff166:a1:e9 20:00:00:24:ff167:29:7d 21:00:00:24:ff167:29:7d	297d:2100002	44f67297d-eui.313861323	Refresh 34306136
Vame: Runtime Name: Fibre Channel Adapter: Target:	fr. 20000024ff66a1e9:21000024ff66a1e9-fr. 20000024ff677 vmbba3:C0:T1:L11 20:00:00:24:ff166:a1:e9 21:00:00:24:ff166:a1:e9 20:00:00:24:ff167:29:7d 21:00:00:24:ff167:29:7d	297d:2100002	4ff67297d-eul.313861323	Refresh
Name: Runtime Name: Fibre Channel Adapter: Target:	fc.20000024ff66a1e9:21000024ff66a1e9-fc.20000024ff677 vmbba3:C0:T1:L11 20:00:00:24:ff:66:a1:e9 21:00:00:24:ff:66:a1:e9 20:00:00:24:ff:67:29:7d 21:00:00:24:ff:67:29:7d	297d:2100002	4ff67297d-eui,313861323	Refresh 14306136
Name: Runtime Name: Fibre Channel Adapter: Target:	fc.20000024ff66a1e9:21000024ff66a1e9-fc.20000024ff677 vmbba3:C0:T1:L11 20:00:00:24:ff166:a1:e9 21:00:00:24:ff166:a1:e9 20:00:00:24:ff167:29:7d 21:00:00:24:ff167:29:7d	297d:2100002	:4ff67297d-eui.313861323	Refresh 04306136

8 Repeat this verification procedure for every ESXi host in the configuration. To obtain the EUI (Extended Unique Identifier), run the following commands: # esxcli storage core device list

esxcli storage nmp satp generic deviceconfig set -d eui.3863633861383765 -c= disable_alua_followover

At this point, the configuration is complete, and the volumes are ready to be used as VMFS datastores or raw device mappings.

NOTE: To view the EUI in the Dell Acceleration Appliance for Databases, run volumes -dt --display-flavor vmware

Issues with automatic failback

When all initiator links or all target links fail, workload failover occurs. If the initiator links or the target links are then restored, the Round Robin policy does not perform an automatic failback. Because of the failure of the automatic failback, the system load is unbalanced.

The following explanation about failback policy is taken from the VMware ESX manual (https://pubs.vmware.com/vsphere-50/index.jsp?topic=

%2Fcom.vmware,vcli.examples.doc_50%2Fcli_manage_storage.6.5.html): From the VMware ESX manual (vSphere 5 Command Line Documentation > vSphere Command-Line Interface Documentation > vSphere Command-Line Interface Concepts and Examples > Managing Storage > Managing Path Policies – http://pubs.vmware.com/vsphere-50/index.jsp? topic=%2Fcom.vmware.vcli.examples.doc_50%2Fcli_manage_storage.6.5.html):

Path Policy E	ffects	
Policy	Active/Active Array	Active/Passive Array
Most Recently Used	Administrator action is required to fail back after path failure.	Administrator action is required to fail back after path failure.
Fixed	VMkernel resumes using the preferred path when connectivity is restored.	VMkernel attempts to resume by using the preferred path. This action can cause path thrashing or failure when another SP now owns the LUN.
Round Robin	No fail back.	Next path in round robin scheduling is selected.

To manually restore the configuration of volumes back to its original path, the Manual failback procedure on page 132 must be followed as described here to rebalance the load.

Manual failback procedure

NOTE: Before proceeding with manual failback, ensure that all paths have been re-established.

1 Determine the LUNs that do not have the same Current and Preferred Owner by running the CLI command:

luns -dt --cluster

The Owner/Pref column must display the same node for each LUN. The example here shows different results in this column.

admin@/> luns -dt

Id	Block	Target/Device	Nu	m Conn	Ini G	roup Initiators	Owner/Pref	I
4f8b9efa-d856-11e2-87\	512b	21:00:00:24:ff:67:29:7c	10	21:00:00:24:ff:66:a1:e9	dot22	_esx 21:00:00:24:ff:66:a1:e9	<mark>IONr1i44</mark>	ī
a6-90b11c06e928-LUN0	i -	dot22_rdm_v1	I.	L	I.	21:00:00:24:ff:66:a1:e8	<mark>IONr1i45</mark>	i

2 Determine the volume name for that particular LUN, and determine the USN for the volume by running the CLI volumes -dt command.

Id	1001D	Capacity	Device	T10 Id	USN	Pool	Status	Read	Writt	en Nodes	1
dot22_rdm_v1	bR1eXB-sZMx-zmY\	(200.00 GB	/dev/drbd0	cd765853-dot22_rdm_v1	<mark>cd7 65853</mark>	RAID0_POO	L Connected	10.00 0	3B 0.00	GB IONr1i4	1
	5-fGMH-4rTa-eYz\	4	I.	L	I	I.	I.	I.	1	IONr1i4	51
	3-03cYL1	L	I.	L	I.	1	I.	1	I.	1	ī

3 List the EUIs for FUSIONIO volumes on ESXi host:

```
~ # esxcli storage nmp device list
   eui.6364373635383533
     Device Display Name: FUSIONIO Fibre Channel Disk (dot22_rdm_v1)
     Storage Array Type: VMW_SATP_ALUA
     Storage Array Type Device Config: {implicit_support=on;explicit_support=
   on; explicit_allow=on;alua_followover=on;{TPG_id=257,TPG_state=STBY}{TPG_id=
   513, TPG_state=A0} 
     Path Selection Policy: VMW_PSP_RR
     Path Selection Policy Device Config: {policy=rr,iops=1000,bytes=
   10485760, useANO=0; lastPathIndex=2: NumIOsPending=13, numBytesPending=851968}
      Path Selection Policy Device Custom Config:
     Working Paths: vmhba3:C0:T0:L0, vmhba3:C0:T1:L0
      Is Local SAS Device: false
      Is Boot USB Device: false
4 Map the USN of the volume to the EUI in the VSphere GUI. You can use the CLI
   command volumes -dt --display-flavor vmware to do this. For example:
admin@IONr1n45/> volumes -dt --display-flavor vmware
     Capacity |T10/USN/EUI |Pool |Status |Read/Write|Nodes
Id
_____
v12
      |300.00 GB |T10|ab0c4aa3-v12
                                    |raid0_pool|Connected |R|0.00 GB
IONr1n44
                 USN ab0c4aa3 | | | | | 0.00 GB
      IONr1n45 !!
      EUI 6162306334616133
                                                   admin@IONr1n45/> luns -dt
         |Status|Device|Target
ЪТ
                                                    Ini
Group | Initiators(*=Active) | Owner/Pref
```

```
4d929f3c-e5dd-11e3-b7\|Active|oel_vm|21:00:00:24:ff:67:29:7c |esx_clus
|21:00:00:24:ff:66:a1:e8 |IONr1n45
98-90b11c06e928-LUN0 |512b |#0 | |
|21:00:00:24:ff:6c:ca:d3 |
| | | | | | |
|21:00:00:24:ff:6c:ca:d2* |
| | | | | | |
|21:00:00:24:ff:66:a1:ea* |
```

- 5 On the vSphere GUI, navigate to the ESXi node and then click **Configuration > Storage Adapters**.
- $6 \quad \text{Select the desired vmhba number.}$
- 7 In the View section, click **Devices** to view the FUSIONIO volumes.
- 8 Select the volume and right-click Manage Paths.
- 9 Click Disable Current Active Path.
- 10 Re-enable the disabled path.

Policy ————									
Path Selection:		Round Robin (VMv	vare)					- cr	ange
Storage Array Ty	/pe:	VMW_SATP_ALUA							
Paths									
Runtime Name	Targe	et			LUN	Statu	JS	Preferred	
vmhba2:C0:T1:L6	5 20:00):00:24:ff:67:29:7	d 21:00:00:24:ff:67	29:7d	6	•	Active (I/O)		
vmhba2:C0:T0:L6	5 20:00):00:24:ff:67:29:7	c 21:00:00:24:ff:6	Disable			Active (I/O)		
vmhba3:C0:T0:L6	5 20:00):00:24:ff:67:5f:6()21:00:00:24:ff:67	N Preferr	ed		5tand by		
vmhba3:C0:T1:L6	5 20:00):00:24:ff:67:5f:6:	l 21:00:00:24:ff:67	CODY D	ath to clipboar	d	5tand by		
									Refresh
Name:	fc.20000	024ff6ccad0;2100	0024ff6ccad0-fc.200	00024ff6729	97d:21000024fl	f67297d	-eui,64363664	133353165	Refresh
Name: Runtime Name:	fc.20000 vmhba2:	024ff6ccad0:2100 C0:T1:L6	0024ff6ccad0-fc.200	00024ff6729	97d:21000024fi	f67297d	-eui.64363664	433353165	Refresh
Name: Runtime Name:	fc.20000 vmhba2:	024ff6ccad0:2100 C0:T1:L6	D024ff6ccad0-fc.200	00024ff6729	97d:21000024fi	f67297d	l-eui.64363664	433353165	Refresh
Name: Runtime Name: Fibre Channel	fc.20000 vmhba2:	024ff6ccad0:2100 C0:T1:L6	0024ff6ccad0-fc.200	00024ff6729	97d:21000024fi	f67297d	l-eui.64363664	433353165	Refresh
Name: Runtime Name: Fibre Channel Adapter:	fc.20000 vmhba2: 20:00:00	024ff6ccad0:2100 C0:T1:L6 :24:ff:6c:ca:d0 21	0024ff6ccad0-fc.200	00024ff6729	97d:21000024fi	f67297d	-eui.64363664	433353165	Refresh
Name: Runtime Name: Fibre Channel Adapter: Target:	fc.20000 vmhba2: 20:00:00 20:00:00	024ff6ccad0:2100 C0:T1:L6 :24:ff:6c:ca:d0 21 :24:ff:67:29:7d 21	0024ff6ccad0-fc.200 00:00:24:ff:6c:ca:c 00:00:24:ff:6c:ca:c	00024ff6729 0 0 7d	97d:21000024fi	f67297d	-eui.64363664	433353165	Refresh
Name: Runtime Name: Fibre Channel Adapter: Target:	fc.20000 vmhba2: 20:00:00 20:00:00	024ff6ccad0:2100 C0:T1:L6 :24:ff:6c:ca:d0 21 :24:ff:67:29:7d 21	0024ff6ccad0-fc.200 00:00:24:ff:6c:ca:c 00:00:24:ff:67:29:	00024ff6729 0 0 7d	97d:21000024fi	f67297d	-eui.64363664	433353165	Refresh
Name: Runtime Name: Fibre Channel Adapter: Target:	fc.20000 vmhba2: 20:00:00 20:00:00	024ff6ccad0:2100 C0:T1:L6 :24:ff:6c:ca:d0 21 :24:ff:67:29:7d 21	0024ff6ccad0-fc.200 00:00:24:ff:6c:ca:c 00:00:24:ff:67:29:	00024ff6729 0 7d	97d:21000024fi	f67297d	-eui.64363664	433353165	Refresh
Name: Runtime Name; Fibre Channel Adapter: Target:	fc.20000 vmhba2: 20:00:00 20:00:00	024ff6ccad0:2100 C0:T1:L6 :24:ff:6c:ca:d0 21 :24:ff:67:29:7d 21	0024ff6ccad0-fc.200 00:00:24:ff:6c:ca:c 00:00:24:ff:67:29:	00024ff6729 0 7d	97d:21000024f	f67297d	-eui.64363664	433353165	Refresh

Disabling VAAI functionality in ESXi

VAAI (vStorage APIs for Array Integration) should be disabled when running the Dell Acceleration Appliance for Databases with ESXi. This avoids issues with responses to VAAI primitives.

To disable VAAI, complete the tasks outlined in this article:

http://kb.vmware.com/selfservice/microsites/search.do?language=en_US&cmd= displayKC&externalId=1033665

Configuring ESXi initiators with iSCSI

HA configuration

1 Set the default PSP for ALUA SATP to VMW_PSP_RR (round robin):

esxcli storage nmp satp set --default-psp VMW_PSP_RR --satp VMW_SATP_ALUA

2 To apply this setting to LUNs that have already been discovered, restart the system.

Setting up an ESXi initiator

For this example, the following assumptions are made:

- The ESXi 5.1 initiator has a dual-port, 10GbE Emulex NC552SFP card installed and configured for iSCSI, with IP addresses of 192.168.10.100 and 192.168.11.100.
- The target is the Dell Acceleration Appliance for Databases HA system.
- Each HA node has a dual-port 10GbE Intel 82599EB card installed and configured for iSCSI at 192.168.10.45, 192.168.11.45 first node, and 192.168.10.46 and 192.168.11.46 second node.
- The Dell Acceleration Appliance for Databases volume of 50GB with LUNs has been created and presented to the ESXi 5.1 initiator.

The following iSCSI information is reported from the ESXi host, after successful installation of the proper driver for the iSCSI adapter:

```
~ # esxcli network nic list |grep Emulex
vmnic4 0000:007:00.0 be2net Up 10000 Full 44:1e:a1:17:49:18 1500
Emulex Corporation NC552SFP 2-port 10Gb Server Adapter
vmnic5 0000:007:00.1 be2net Up 10000 Full 44:1e:a1:17:49:1c 1500
Emulex Corporation NC552SFP 2-port 10Gb Server Adapter
```

To set up the initiator:

- 1 Open the vSphere Client/VMware Infrastructure (VI) Client or vCenter Server.
- 2 Ensure that you have a separate vSwitch for iSCSI. (All iSCSI entries can be grouped into one vSwitch.)

3 Add VMKernel and Management Console ports and identify them with appropriate IP addresses.

localhost.int.tusionio.com ¥Mware ESX	i, 5.1.0, 1065491 Evaluation (31 days remaining)	
Getting Started 🔨 Summary 🔪 Virtual Mac	hines Resource Allocation Performance Configuration Local Users & Groups Even	nts Permissions
Hardware	View: VSphere Standard Switch	
Health Status Processors Memory Storage • Networking Storage Adapters Network Adapters	Vetworking Standard Switch: vSwitch0 Remove Virtual Machine Port Group Physical Adapters VM Network Image: Winking Port Group VMMemol Port Group Image: Winking Port Group VMMemol Port Group Image: Winking Port Group VMMemol Port Group Image: Winking Port Group	Refresh Add Networking Properties
Advanced Settings Power Management Software	vmk0 : 10.60.34.100 fe60::a6ba:dbff:fe17:7466	
Licensed Features Time Configuration DNS and Routing Authentication Services	VMkernel vmk1 : 192.168.10.100	
Virtual Machine Startup/Shutdown Virtual Machine Swapfile Location Security Profile Host Cache Configuration	Standard Switch: vSwitch2 Remove Properties VMiernel Port VMiernel 2 VMiernel 1 10000 Full	
System Resource Allocation Agent VM Settings Advanced Settings	vmk2:192.168.11.100	

4 Ensure that the iSCSI targets are reachable from the ESX host by using ping or $_{\rm vmkping:}$

```
~ # ping 192.168.10.45
PING 192.168.10.45 (192.168.10.45): 56 data bytes
64 bytes from 192.168.10.45: icmp_seq=0 ttl=64 time=0.254 ms
64 bytes from 192.168.10.45: icmp_seq=1 ttl=64 time=0.133 ms
```

```
~ # ping 192.168.10.46
```

```
PING 192.168.10.46 (192.168.10.46): 56 data bytes
64 bytes from 192.168.10.46: icmp_seq=0 ttl=64 time=0.271 ms
64 bytes from 192.168.10.46: icmp_seq=1 ttl=64 time=0.138 ms
Assuming that the Dell Acceleration Appliance for Databases has been set up with
initiator groups, initiators, volumes, and LUNs available to the ESX initiator, you can
log in to each target portal.
```

- 5 Log in to vCenter Server.
- 6 Click the ESX host and click **Configuration**.
- 7 Click Storage Adapters.
- 8 Click the iSCSI VMHBA to be modified.
- 9 Click **Properties**.
- 10 Click Advanced.
- 11 On the dialog box that is displayed, disable **DelayedAck** and set **Login Timeout** to 30 seconds.

- 12 On the Storage Adapters section, click the iSCSI Software Adapter.
- 13 On the Details pane, click **Properties**.
- 14 On the General tab, click **Configure** and click **Enabled**.
- 15 Click **OK**. The Status is enabled, and the iSCSI name has a valid IQN.

You can now configure the iSCSI array to use the IQN you have just created. Generally, you also need to assign storage to the ESX host from the array:

- 1 Click the **Dynamic Discovery** tab and click **Add**.
- 2 In the Add Send Targets Server section, add the iSCSI array IP addresses to the iSCSI Server field and click **OK**.
- 3 After the iSCSI Server is added, click **Close**.

The General tab for the iSCSI Initiator shows the iSCSI properties and initiator status:

🛃 iSCSI Initiator (vmhba33) Proj	perties	
General Network Configuration E)ynamic Discovery Static Discovery	
Name: ic Alias:	n.1998-01.com.vmware:localhost-360fde19	
Target discovery methods: S	end Targets, Static Target	
Software Initiator Properties	nabled	

The Dynamic Discovery tab shows locations from where the iSCSI targets can be discovered.

2	iSCSI I	nitiator (vmhba33) Pr	operties		_ 🗆 🗡
þ	General	Network Configuration	Dynamic Discovery	Static Discovery	
	Send 1	argets			
	Discove	er iSCSI targets dynamica	lly from the following	locations (IPv4, IPv6, host na	ame):
	iscsi s	Server Location			
	192.16	8.10.45:3260			
	192.16	8.11.45:3260			
	192.16	8.10.46:3260			
	192.16	8.11.46:3260			
	1				

4 Rescan the ESX host storage in the Storage Adapters section.

5 After the rescan completes, click the iSCSI initiator to see information about the SAN array, and one or more targets.

The disk device is discovered:

Details										
vmhba33									Properties	
Model:	iSCSI Software Adapter									
iSCSI Name:	ign.1998-01.com.vmware:localhos	st-360fde19								
iSCSI Alias:										
Connected Targets:	4 Devices: 1	Paths: 4								
View: Devices Pat	ns									_
Name			Runtime Name	Operational State	LUN	Drive Type	Туре	Transport	Capacity Owne	er
FUSIONIO iSCSI Disk (eui.3266306435333061)		vmhba33:C0:T0:L0	Mounted	0	Non-SSD	disk	iSCSI	46.57 GB NMP	
1										

Multipath information about the two Active and two Standby paths is also displayed: Details

Model: iSCSI Name: iSCSI Alias:	iSCSI Software Adapter iqn.1998-01.com.vmware:localhost-360fde19		
Connected Target	s: 4 Devices: 1 Paths: 4		
View: Devices	Paths		
Runtime Name	Target	LUN	Status
vmhba33:C0:T3:L0	iqn.2007-02.com.fusionio:sn.s11295123400053:eth3:192.168.11.46:3260	0	🔶 Active (I/O)
vmhba33:C0:T2:L0	iqn.2007-02.com.fusionio:sn.s11295123400053:eth1:192.168.10.46:3260	0	🔶 Active
		0	 Stand by
vmhba33:C0:T1:L0	iqn.2007-02.com.fusionio:sn.s11295123312693:eth3:192.168.11.45:3260	0	 Drand by

Setting up InfiniBand/SRP initiators

NOTE: Although this section is primarily intended for HA mode, you can also use these instructions to configure standalone systems.

Installing the multipath daemon

In order to set up InfiniBand/SRP initiators, you must install and configure the multipath daemon. For assistance, contact support at dell.com/support/home.

Installing the InfiniBand/SRP software stack

After having installed and configured the multipath daemon, you need to install the InfiniBand/SRP software packages. The names of some of these packages vary between Linux distributions. Examples are provided for RHEL 6 and OL 6

Package	RHEL 6 / OL 6		
InfiniBand core	rdma		
Mellanox ConnectX user space driver	libmlx4		
Mellanox firmware tool	mstflint		
InfiniBand Subnet Manager	opensm		
InfiniBand diagnostic tools	infiniband-diags ibutils perftest		
SRP tools	srptools		
PCI tools	pciutils		
SCSI tools	lsscsi sg3_utils		

Table 9-1. Infinband packages that need to be installed

The InfiniBand/SRP configuration files can be found in the following locations: **Table 9-2.** Locations of InfiniBand/SRP configuration files

	RHEL6 / OL 6
InfiniBand/SRP core	/etc/rdma/rdma.conf
opensm	/etc/rdma/opensm.conf
SRP daemon	/etc/srp_daemon.conf
SRP kernel module	/etc/modprobe.d/ib_srp.conf

Configuring InfiniBand/SRP

Here are the configuration changes you need to make for InfiniBand/SRP:

- 1 Set SRP_LOAD=yes and MLX_LOAD=yes in the InfiniBand/SRP core configuration file
 /etc/rdma.conf.
- 2 When using an unmanaged InfiniBand/SRP switch, or when not using an InfiniBand/SRP switch at all, configure the GUID of the port over which opensm should run in the opensm configuration file. (An unmanaged switch is a switch without subnet management functionality.)

NOTE: A subnet manager in an InfiniBand switch and opensm provide the same functionality: InfiniBand subnet management. Running a single subnet manager is sufficient. If multiple subnet managers are active in the same subnet one of them will be the master and the others slaves. If the master fails one of the slaves will become the new master. In other words, enabling multiple subnet managers provides redundancy. However, there is also a risk associated with enabling multiple subnet manager to reassign all the LIDs. Reassigning LIDs is a disruptive operation in an IB network because it causes ongoing communication to fail until all IB connections have been reestablished by the software that uses the IB network.

- 3 If the SRP daemon must not automatically log in to all SRP targets, modify the SRP daemon configuration file accordingly.
- 4 Performance can be improved by increasing the maximum SRP scatter/gather list size. To do this, create the file /etc/modprobe.d/ib_srp.conf. This configuration will go into effect the next time the SRP initiator is loaded.

```
echo options ib_srp cmd_sg_entries=255 > /etc/modprobe.d/ib_srp.conf
modprobe -r ib_srp
modprobe ib_srp
cat /sys/module/ib_srp/parameters/cmd_sg_entries
```

5 Ensure that the InfiniBand/SRP HCAs are visible on the PCI bus:

```
# lspci | grep Mellanox
02:00.0 Network controller: Mellanox Technologies MT27500 Family [ConnectX-
3]
```

6 Ensure that the number of PCIe lanes assigned to the HCA will allow it to operate at full speed. To do this, compare the LnkCap and LnkSta parameters in the lspci output:

```
# lspci -vv | sed -rne '/Mellanox/,/^$/ s/^[^[:blank:]]|LnkSta:|LnkCap:/&/p'
02:00.0 Network controller: Mellanox Technologies MT27500 Family [ConnectX-
3]
LnkCap: Port #8, Speed 8GT/s, Width x8, ASPM L0s, Latency L0 unlimited, L1
unlimited
LnkSta: Speed 5GT/s, Width x8, TrErr- Train- SlotClk+ DLActive- BWMgmt-
ABWMgmt-
```

7 Ensure that the InfiniBand/SRP HCA firmware is up to date:

```
# lspci | grep Mellanox | while read a b; do echo ==== $a; mstflint -d $a
query; done
==== 0000:06:00.0
Image type:
                ConnectX
FW Version:
                2.11.500
Rom Info:
                type=PXE version=3.4.142 devid=4099 proto=VPI
                4099
Device ID:
                                                                   Sys image
Description:
                Node
                                 Port1
                                                  Port2
GUIDs:
                0002c90300a05de0 0002c90300a05de1 0002c90300a05de2
0002c90300a05de3
                                      0002c9a05de0
                                                       0002c9a05de1
MACs:
                (MT_1090120019)
Board ID:
VSD:
PSID:
                MT_1090120019
==== 0000:07:00.0
Image type:
                ConnectX
                2.11.500
FW Version:
Rom Info:
                type=PXE version=3.4.142 devid=4099 proto=VPI
Device ID:
                4099
Description:
                Node
                                 Port1
                                                  Port2
                                                                   Sys image
                0002c90300a04250 0002c90300a04251 0002c90300a04252
GUIDs:
0002c90300a04253
                                      0002c9a04250
                                                       0002c9a04251
MACs:
Board ID:
                 (MT_1090120019)
VSD:
                MT 1090120019
PSID:
```

8 Ensure that the InfiniBand/SRP HCAs are recognized by their kernel driver. For example:

```
# (cd /etc/init.d; if [ -e ./rdma ]; then ./rdma start; else ./openibd start;
fi)
# ls /sys/class/infiniband
mlx4_0 mlx4_1
```

9 If necessary, start opensm and wait until it has configured the fabric. For a small fabric, configuration finishes less than twenty seconds after opensm starts.

(cd /etc/init.d; if [-e ./opensm]; then ./opensm start; else ./opensmd start; fi)

10 Check which nodes can communicate with each other over the fabric, as follows:

11 Check the fabric status:

```
# ibdiagnet -r
[ ... ]
-I- Stages Status Report:
    STAGE Errors Warnings
    Bad GUIDs/LIDs Check 0 0
```

Link State Active Check	0	0
General Devices Info Report	0	0
Performance Counters Report	0	0
Partitions Check	0	0
IPOIB Subnets Check	0	0
Subnet Manager Check	0	0
Fabric Qualities Report	0	0
Credit Loops Check	0	0
Multicast Groups Report	0	0

12 Ensure that the initiator system can communicate with the InfiniBand/SRP target systems in the same subnet:

for d in /dev/infiniband/umad*; do echo

==== SRP target ports reachable via \$d; srp_daemon -oacd\$d; done ==== SRP target ports reachable via /dev/infiniband/umad0 id_ext=0002c90300a38490,ioc_guid=0002c90300a38490,dgid= fe80000000000000002c90300fc3211, pkey=ffff,service_id=0002c90300a38490 id_ext=0002c90300a4f4d0,ioc_guid=0002c90300a4f4d0,dgid= fe80000000000000002c90300fc3221, pkey=ffff,service_id=0002c90300a4f4d0 id_ext=0002c90300a38490,ioc_guid=0002c90300a38490,dgid= fe80000000000000002c90300a34a31, pkey=ffff,service_id=0002c90300a38490 id_ext=0002c90300a38490,ioc_guid=0002c90300a38490,dgid= fe80000000000000002c90300a38491, pkey=ffff,service_id=0002c90300a38490 id_ext=0002c90300a38490,ioc_guid=0002c90300a38490,dgid= fe80000000000000002c90300a38492, pkey=ffff,service_id=0002c90300a38490 id_ext=0002c90300a4f4d0,ioc_guid=0002c90300a4f4d0,dgid= fe80000000000000002c90300a4f4c1, pkey=ffff,service_id=0002c90300a4f4d0 id_ext=0002c90300a4f4d0,ioc_guid=0002c90300a4f4d0,dgid= fe80000000000000002c90300a4f4d1, pkey=ffff,service_id=0002c90300a4f4d0 id_ext=0002c90300a4f4d0,ioc_guid=0002c90300a4f4d0,dgid= fe80000000000000002c90300a4f4d2, pkey=ffff,service_id=0002c90300a4f4d0 ==== SRP target ports reachable via /dev/infiniband/umad1 id_ext=0002c90300a38490,ioc_guid=0002c90300a38490,dgid= fe80000000000000002c90300fc3211, pkey=ffff,service_id=0002c90300a38490 id_ext=0002c90300a4f4d0,ioc_guid=0002c90300a4f4d0,dgid= fe80000000000000002c90300fc3221, pkey=ffff,service_id=0002c90300a4f4d0 id_ext=0002c90300a38490,ioc_quid=0002c90300a38490,dqid= fe80000000000000002c90300a34a31, pkey=ffff,service_id=0002c90300a38490 id_ext=0002c90300a38490,ioc_guid=0002c90300a38490,dgid= fe80000000000000002c90300a38491, pkey=ffff,service_id=0002c90300a38490 id_ext=0002c90300a38490,ioc_guid=0002c90300a38490,dgid= fe80000000000000002c90300a38492, pkey=ffff,service_id=0002c90300a38490 id_ext=0002c90300a4f4d0,ioc_quid=0002c90300a4f4d0,dqid= fe80000000000000002c90300a4f4c1, pkey=ffff,service_id=0002c90300a4f4d0 id_ext=0002c90300a4f4d0,ioc_guid=0002c90300a4f4d0,dgid= fe80000000000000002c90300a4f4d1, pkey=ffff,service_id=0002c90300a4f4d0 id_ext=0002c90300a4f4d0,ioc_quid=0002c90300a4f4d0,dqid= fe80000000000000002c90300a4f4d2, pkey=ffff,service_id=0002c90300a4f4d0

13 After the entire IB stack is working, run chkconfig to make the InfiniBand/SRP core, opensm, and SRP tools start automatically.

for s in rdma openibd opensm opensmd srpd; do [-e /etc/init.d/\$s] && echo
==== \$s && chkconfig \$s on; done
chkconfig --list | grep -E 'rdma|openib|opensm|srpd'

opensm	0:off	1:off	2:on	3:on	4:on	5:on	6:off
rdma	0:off	1:off	2:on	3:on	4:on	5:on	6:off
srpd	0:off	1:off	2:on	3:on	4:on	5:on	6:off

Installing the IB_SRP-BACKPORT package

After you have installed the InfiniBand/SRP components, you need to install the ib_srp-backport.RPM.

About ib_srp-package.rpm

CAUTION! Dell does not support the use of any InfiniBand OFED packages for Linux. You should only use the InfiniBand stack provided by your Linux vendor with all of the available kernel updates applied.

In addition, Dell recommends installing and using the following third-party ib_srpbackport package for faster failover times and higher performance:

https://github.com/bvanassche/ib_srp-backport

This package provides the source code for making two kernel modules: scsi_transport_srp.ko and ib_srp.ko. The updates in the ib_srp-backport package are
in newer Linux kernel versions (3.11+). These changes should be available in updated
releases of major Linux distributions such as Red Hat Enterprise Linux (RHEL) 6 and
beyond.

The driver source code, including the procedure for generating a binary RPM is available on the website. The contents of the binary .RPM not only depend on the operating system version (for example, RHEL 6.4+) but also on the kernel updates that have been installed. Thus, as with many different kernel modules, a new build of the ib_srpbackport .RPM must be created and installed after each kernel update.

Installation

To install the ib_srp-backport .RPM

1 Run the following commands as a non-privileged user:

```
$ rpmbuild --rebuild ib_srp-backport-*.src.rpm
```

```
$ (cd $(rpm --eval '%{_topdir}')/RPMS/$(uname -m) && find -name 'ib_srp-
backport*.rpm' )
```

```
./ib_srp-backport-3.10.0-123.20.1.el7.x86_64-2.0.29-1.x86_64.rpm
```

./ib_srp-backport-3.10.0-123.20.1.el7.x86_64-debuginfo-2.0.29-1.x86_64.rpm

2 Obtain root privileges and install the generated RPM. For example:

```
rpm -U $(rpm --eval '%{_topdir}')/RPMS/$(uname -m)/ib_srp-backport-*.rpm
```

Separating IPoIB from SRP traffic

Although a single HCA port can run IPoIB and SRP communication simultaneously, it is possible to separate IPoIB from SRP traffic. An effective way to separate these two communication protocols is to use a different IB partitions for each protocol. An IB partition is a set of ports that are allowed to communicate with each other. Each partition is identified by a 15 bit number which is called a P_Key. A single IB port can be a member of more than one partition at the same time. Communication between two IB ports is only allowed if both are member of the same partition. This means that defining disjoint partitions for the IPoIB and SRP ports will separate these two traffic types.

Since the IB subnet manager controls which IB port is member of which IB partition configuration of partitions happens through the subnet manager. Instructions for how to configure partitions when using OpenSM as subnet manager can be found in http://git.openfabrics.org/?p=~halr/opensm.git;a=blob;f=doc/partition-config.txt
Troubleshooting

The procedures in this section can be used to troubleshoot issues that may be encountered with the DAAD.

After node restore, initiators may not connect correctly

If a single node in a cluster is restored, the initiators that were previously connect to it do not connect correctly to the preferred node. This is because the UUID of the node volume is different after restore, and the initiators need to be reconfigured to see the volume correctly.

After the node has been restored, run the following command from any initiators that are not connecting to the correct preferred node: multipath -r

Login Failure With RHEL Initiators

When using RHEL's <code>qlogic qla2xxx</code> driver, the initiator may fail to log in to the target. When this happens, disk failure messages will appear in <code>/var/log/messages</code>.

To resolve this issue, use the <code>qla2xxx</code> module parameter on the initiator side:

```
modprobe qla2xxx ql2xasynclogin=0
```

To have this setting used automatically, create the /etc/modprobe.d/qla2xxx.conf file and add the following line:

```
options qla2xxx ql2xmaxqdepth=2
```

If qla2xxx is loaded during boot time, run mkinitrd (or dracut -f on RHEL 6.x) to pick up the changes.

Oracle Linux 6.3 issues

When running Oracle Linux 6.3, OpenSM and srptools may encounter problems. The following error may be displayed:

```
# srp_daemon -oaev >/dev/null
```

26/07/13 12:49:01 : umad_open_port failed for device mlx4_0 port 1

The reason is that neither the OpenSM package nor the srptools package works on an unmodified Oracle Linux 6.3 system.

To resolve this issue:

1 Add the following code to the end of the /lib/udev/rules.d/50-udevdefault.rules file:

```
# InfiniBand
KERNEL=="umad*", NAME="infiniband/%k"
KERNEL=="issm*", NAME="infiniband/%k"
KERNEL=="uverbs*", NAME="infiniband/%k"
KERNEL=="ucm*", NAME="infiniband/%k"
KERNEL=="ucma", NAME="infiniband/%k"
KERNEL=="rdma_cm", NAME="infiniband/%k"
```

- 2 Run the following command to restart rdma:
 - # /etc/init.d/rdma restart
- 3 Wait for a few seconds after rdma has restarted, and then run the following commands to ensure that the changes have solved the issue:

```
# srp_daemon -oac
# opensm
```

OpenSM and srptools will now start as expected.

Linux cleanup after LUN removal

Linux does not automatically clean up after the Dell Acceleration Appliance for Databases LUN removals. For RHEL or OL, the required steps for LUN removal are described here:

https://access.redhat.com/site/documentation/en-US/Red_Hat_Enterprise_Linux/6/html/Storage_Administration_Guide/removing_devic es.html

For all distros, before running multipath -f, run the following command:

dmsetup message mpathXYZ 0 "fail_if_no_path"

where mpathXYZ is the name of the device.

LUN 0 deletion problems in Oracle VM

When deleting LUN 0, Oracle VM runs certain multipath commands that create a multipath device for the deleted LUN 0 device. This results in invalid multipath devices and Oracle VM HCL failures.

When using Oracle HCL:

1 Add the following to the /etc/multipath.conf file:

```
blacklist {
    wwid 23565323633313765
}
```

2 Restart multipathd, if it is running. This prevents the multipath tools that come with Oracle HCL from making a multipath device when there is no LUN 0.

Network manager and UDEV issues with RHEL 6.4+

Problem

When using the Mellanox ConnectX-3 driver, mlx4_en, in RHEL, the Network Manager and udev tools incorrectly reset and set up the network devices. This results in the network devices being renamed or incorrectly shut down, and possibly incapable of receiving frames.

Solution

Network Manager must be disabled, and one of the udev rules must be modified, as follows:

- 1 Complete the tasks listed at this Red Hat link to stop the Network Manager service: https://access.redhat.com/site/documentation/en-US/Red_Hat_Enterprise_Linux_OpenStack_Platform/3/html/Installation_and_Con figuration_Guide/Disabling_Network_Manager.html
- 2 Ensure that the Network Manager service is stopped by running the service command:

service NetworkManager stop

3 Ensure that the Network Manager service is disabled at startup by using the chkconfig command:

chkconfig NetworkManager off

- 4 Open each interface configuration file on the system in a text editor. Interface configuration files are found in the /etc/sysconfig/network-scripts/ directory. They have names of the form ifcfg-x, where X is replaced by the name of the interface. Valid interface names include eth0, p1p5, and em1.
- 5 In each configuration file, ensure that the NM_CONTROLLED configuration key is set to no and the ON_BOOT configuration key is set to yes.

NM_CONTROLLED=no ONBOOT=yes

6 Ensure that the network service is started by using the service command:

service network start

7 Ensure that the network service is enabled at startup by using the *chkconfig* command:

chkconfig network on

To prevent udev from creating duplicate eth-X entries in /etc/udev/rules.d/70persistent-net.rules, modify the following udev rule:

ln:

```
/lib/udev/rules.d/75-persistent-net-generator.rules
Add this line:
```

DRIVERS=="mlx4_core", ENV{MATCHDEVID}="", ENV{MATCHIFTYPE}=""

NOTE: When udev is updated, this line must be re-added.

Handling configuration changes

After volumes have been added, deleted, or resized, it is important to rescan LUNs on each affected initiator system. The most convenient way to rescan LUNs is by running the rescan-scsi-bus.sh script. For example:

```
# rescan-scsi-bus.sh --forcerescan
Scanning SCSI subsystem for new devices and remove devices that have disappeared
Scanning host 34 for SCSI target IDs 0 1 2 3 4 5 6 7, all LUNs Scanning for
device 34 0 0 0 ...
OLD: Host: scsi34 Channel: 00 Id: 00 Lun: 00 Vendor: FUSIONIO Model: ION LUN Rev:
3243 Type: Direct-Access ANSI SCSI revision: 05 0 new device(s) found. 0
device(s) removed.
```

CAUTION! Failure to rescan LUNs after having reduced the size of a volume may lead to data loss.

Informing the multipath daemon of resized devices

After a multipath device is resized on Linux and a rescan is done, the multipath daemon needs to be informed of the change. To do this, run the following commands:

multipathd -k'resize map <your_multipath_device>'

Tips for resizing devices with multipathing

To resize a device, you must first resize it on the target/Dell Acceleration Appliance for Databases side, and then on the initiator side. For RHEL 6.X and OEL 6.X, follow the steps out lined in the Red Hat Storage guide:

https://access.redhat.com/site/documentation/en-US/Red_Hat_Enterprise_Linux/6/html/Storage_Administration_Guide/online-iscsiresizing.html

Resolving path failures during multipathing scans

If a path fails while multipathd is scanning the path UID, then multipathd does not recognize that path until it is rescanned explicitly. To ensure whether multipathd failed to add one or more paths, run the following command:

echo show paths | multipathd -k | grep faulty
388:0:0:10 sdlt 68:432 1 undef faulty running orphan
388:0:0:11 sdlu 68:448 1 undef faulty running orphan

You can also force multipathd to reconsider faulty paths, as follows:

echo reconfigure | multipathd -k

Application tuning

This section outlines best practices for using the Dell Acceleration Appliance for Databases with Oracle and Oracle ASM.

Oracle implementation best practices

- After configuring the Dell Acceleration Appliance for Databases, export the Dell Acceleration Appliance for Databases volumes to the Oracle nodes (standalone or RAC).
- Install Oracle with the "database binary" (software-only) option.
- Run the Oracle synthetic benchmark tool Orion to measure IOPS and bandwidth on DAAD volumes with various workloads (OLTP, DSS, RAID). You can also use the FIO tool to benchmark these performance categories.
- Ensure that the Orion/FIO performance statistics approximate the theoretically possible performance of the hardware setup (HBAs on the target, initiator, and ioMemory device).
- Install Oracle Grid Infrastructure. Configure the database and run the read only ioCalibration tool to determine the IOPS, MBPS, and latency of the setup.
- Record your performance statistics. These will serve as the baseline for the setup if application performance issues are noted during workload tests.
- Configure NUMA and HugePages for Oracle.

ASM best practices

- ASM limits the LUN size to 2TB or less, so the Dell Acceleration Appliance for Databases volumes should be created no larger than that. (This restriction applies to Oracle grid and database versions older than 12.1.0.1. Please refer to the administrative guide for your database version for further details.)
- An ASM diskgroup can be created using one or multiple Dell Acceleration Appliance for Databases volumes. For better performance, Dell recommends that you create fewer ASM diskgroups on more Dell Acceleration Appliance for Databases volumes.
- Use the 512B sector size when exporting volumes to initiators. If you need to export LUNs with a 4KB sector size, use Oracle or third-party-provided ASMLIB support packages. ASMLIB support is now available for RHEL 6.x. For details, click

http://www.oracle.com/technetwork/server-storage/linux/asmlib/rhel6-1940776.html

- You may also need to use the _disk_sector_size_override parameter to overcome an Oracle ASM diskgroup creation error.
- ASM distributes data on all the ASM disks in the disk group. A diskgroup can be created with an option for NORMAL REDUNDANCY (two-way mirroring), HIGH REDUNDANCY (three-way mirroring) or EXTERNAL REDUNDANCY (no mirroring). For the Dell Acceleration Appliance for Databases, no significant performance differences have been observed between these ASM mirroring options.
- It is generally advisable to use the default 1MB allocation unit (AU) size. For larger (3TB+) databases, the AU size can be increased to 4M or 8M.
- If more than two DAADs are used (without HA options), then by carefully creating ASM diskgroup mirroring options can avoid outages due to the rare scenario of DAAD node/component failures. For example, if you have three sets of DAAD volumes from three different DAAD nodes and all part of a HIGH redundancy mirroring option, then losing two DAADs completely would still make the application function without errors (assuming there is enough free disk space for the database transactions).

Exporting LUNs to initiators

In RAC, Dell recommends that you have separate, small Dell Acceleration Appliance for Databases volumes for Oracle cluster voting disks, with Normal or High redundancy ASM mirroring. Optionally, versions 11gR2 and 12c support voting disks as part of regular ASM diskgroups. Careful planning is needed here to avoid Oracle RAC node evictions.

For Oracle RAC configuration, Dell recommends that you have one initiator group for all participating Oracle initiator nodes. This will greatly decrease the time spent in LUN-mapping.

If you are planning to assign LUNs to various initiators, you should create the initiator groups individually.

Because LUN mappings include the target/initiator port addresses, Dell recommends that you tag the cables and ports. This helps in reconnecting to the same ports if the direct-connected cables need to be removed or exchanged.

ASM storage configurations

The configurations that follow are variations that may serve your particular storage needs, using Oracle ASM and the Dell Acceleration Appliance for Databases.

HA mode, one diskgroup

One large ASM diskgroup can be created with External Redundancy, which means no mirroring is done by ASM. Here is the basic procedure:

1 Place all the Dell Acceleration Appliance for Databases storage from both the HA nodes into one ASM diskgroup called DATA.

2 Have Oracle write the OCR and Voting Disk files to DATA, which gets passed through to the underlying LUNs on the Dell Acceleration Appliance for Databases.

The HA implementation of the Dell Acceleration Appliance for Databases takes care of creating the redundant copies.

Standalone mode

In standalone mode, Oracle ASM can be used with Normal Redundancy. The procedure uses the first two steps in HA mode, one diskgroup on page 152.

A variation is to use ASM High Redundancy for the OCR and Voting files, and Normal Redundancy for the database files. To do this:

- 3 Create a 1 GB partition on *n* LUNs from each Dell Acceleration Appliance for Databases node (where *n* is 6 divided by the number of nodes).
- 4 Put those 6 partitions into an ASM diskgroup named CRS with High Redundancy.
- 5 Put all of the remaining storage into the DATA diskgroup with Normal Redundancy.

Standalone mode: Storing OCR and voting files

When using ASM (not Dell Acceleration Appliance for Databases HA) for redundancy, you do not have to store the OCR and Voting files in ASM. During Oracle Clusterware installation, the checkbox for this can be cleared so ASM is not used for these two types of files.

The basic procedure is to create a 1GB partition on the first *n* LUNs from each DAAD until there are six total partitions (two LUNs from each of three Dell Acceleration Appliance for Databases nodes, or one LUN from each of six nodes).

During installation, Oracle Clusterware prompts for the 6 devices on which Oracle stores the OCR and Voting Disk files. There are 6 OCR files and 5 Voting Disk files (the Voting Files are small extents stored in the headers of the OCR files, not separate files themselves).

It is very important to note that this count of files (6 OCR and 5 Voting) means one of the LUNs will not have a Voting File. It is critical that no single Dell Acceleration Appliance for Databases node has a majority of the Voting Disk files, because if a majority of them go offline, Oracle aborts the entire cluster.

For example, in a two-node configuration, there would be three voting files on the first node and two on the second node. Taking the second node offline for maintenance is not a problem, because the majority of Voting Files are still online. However, taking the first node offline causes the entire cluster to abort. The solution calls for a third storage node, which can be a third Dell Acceleration Appliance for Databases node or a legacy SAN. With three storage nodes, two voting files are placed on the first, two on the second, and one on the third. This way, no single node contains a majority of voting files, so the cluster is not aborted.

Best practices for MS SQL server

This section outlines best practices for using the Dell Acceleration Appliance for Databases with MS SQL Server.

MS SQL server implementation best practices

- Configure the Dell Acceleration Appliance for Databases and export its volumes to the SQL DB nodes (standalone or cluster)
- Run the SQLIO synthetic benchmark tool to measure the IOPS and bandwidth for volumes, with various workloads.
- Ensure that the SQLIO performance statistics approximate the theoretically possible performance of the hardware setup (HBAs on the target, initiator, and Fusion ioDrive devices).
- Record the performance statistics. These will serve as the baseline for the setup if application performance issues are noted during workload tests.

SQL server memory allocation

- Ensure that you allocate sufficient memory space for the OS processes. As a best practice, earmark 1GB for every 4 cores and allocate the rest to the *Max server memory (MB)* parameter.
- Use the following dynamic management views to troubleshoot memory issues that may occur:
 - sys.dm_os_memory_brokers provides information about memory allocations using the internal SQL Server memory manager. The information provided can be useful in determining very large memory consumers.
 - sys.dm_os_memory_nodes and sys.dm_os_memory_node_access_stats provides a summary of the memory allocations per memory node and node access statistics, grouped by type of page. This information can be used to quickly obtain a summary of memory usage, without running DBCC MEMORYSTATUS.
 - sys.dm_os_nodes provides information about CPU node configuration for SQL Server. This DMV also reflects software NUMA (soft-NUMA) configuration.
 - sys.dm_os_sys_memory returns the system memory information. The "Available physical memory is low" value in the system_memory_state_desc column is a sign of external memory pressure that requires further analysis.

Other best practices

- When formatting the partition that will be used for SQL server data files, you should use a 64 KB allocation unit size for data, logs and the TempDB database.
- Lock pages in memory. To reduce SQL server paging, grant the service account "Lock pages in Memory" privileges through the Windows Group Policy editor for both 32- and 64-bit servers.

- Adjust the "Degree of Parallelism" option to the number of cores in a single NUMA node, which is eight or fewer. Test the workload with various degrees of parallelism to arrive at the best combination.
- The default setting for Number of Worker Threads works well for most configurations.
- To ensure efficient operation, create multiple TempDB files (1 per physical CPU core). Pre-size the TempDB files and create them in equal sizes.
- For ease of maintenance, create more than one log file (there is no performance gain in configuring more files).

HA with Windows server failover cluster

If you are deploying Windows Server 2008 with the Dell Acceleration Appliance for Databases, configure your storage to use Windows Server Failover Cluster (WFSC). For MPIO settings, refer to Configuring multipath on Windows on page 108.

- 1 In WSFC, navigate to Storage.
- 2 Click the Advanced Policies tab.
- 3 Set Use this time period to **30** seconds.



4 Click the **Policies** tab.

Cluster Disk 1 Properties	×				
General Dependencies Policies Advanced Policies Shadow Copies					
Response to resource failure					
C If resource fails, do not restart					
If resource fails, attempt restart on current node					
Period for restarts (mm:ss):					
Maximum restarts in the specified period:					
If restart is unsuccessful, fail over all resources in this service or application					
If all the restart attempts fail, begin restarting again after the specified period (hh:mm):					
More about restart policies					
Pending timeout					
Specify the length of time the resource can take to change states between Online and Offline before the Cluster service puts the resource in the Failed state.					
Pending timeout (mm:ss):					
OK Cancel Apply					

- 5 Set Period for restarts to 1:00.
- 6 Set Maximum restarts in the specified period to **30**.
- 7 Set If all restart attempts fail, begin restarting again after the specified period to 15 minutes.

Configuring auto-failback settings

To specify auto-failback settings on a WSFC node for any service or application:

1 Ensure that the preferred owner is selected in the General tab. In the example, the preferred owner is **dot101**.

32FS Prop	erties			
General F	ailover			
ь	532FS			\searrow
Name: b532ES				
Select the buttons to preferred a	preferred owr list them in or t the bottom.	<u>ners</u> for this servi der from most pr	ce or application. eferred at the top	Use the to least
Preferred of the dot10	owners: 01 02			Up Down
Enable	e persistent m start	ode		
Status:	Online			
Node:	dot101			
		OK	Cancel	Apply

2 On the **Failover** tab, set the maximum number of failures as **30** in **1** hour.

b532F5 Properties	x				
General Failover					
Failover					
Specify the number of times the Cluster service will attempt to restart or fail over the service or application in the specified period.					
If the service or application fails more than the maximum in the specified period, it will be left in the failed state.					
Maximum failures in the specified 30					
Period (hours):					
Failback					
Specify whether the service or application will automatically fail back to the most preferred owner (which is set on the General tab).					
C Prevent failback					
Allow failback					
Immediately					
O Failback between: 0 📑 and					
0 - hours					
More about failover and failback					
OK Cancel Apply					

3 In the Failback section, click **Allow failback** and then **Immediately**.

Windows clustering hot fixes

Several hot fixes for Windows Clustering are available on the Microsoft Support site. These may be useful in preventing or resolving issues with Windows clusters used in the Dell Acceleration Appliance for Databases system.

Hot Fix Reference	Description
http://support.microsoft.com/kb/2718576/en-us	This fixes an issue in which an MPIO disk is removed unexpectedly when a PR_IN command fails. This issue occurs when the Failover Clustering feature is configured in a Windows Server 2008 R2 environment.
http://support.microsoft.com/kb/2733575/en-us	SAN targets should reply to PR_IN commands within 3 seconds on Windows Server 2008 and Server 2008 R2.
http://support.microsoft.com/kb/2522766	The MPIO driver fails over all paths incorrectly when a transient, single failure occurs in Windows Server 2008 or in Windows Server 2008 R2.
http://support.microsoft.com/kb/2550886	A transient communication failure causes a Windows Server 2008 R2 failover cluster to stop working.

Contacting technical support

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

dell.com/support/home

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

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

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



Appendix A: DAAD configuration



DAAD platform: Front panel

Figure A-1 shows the front view of the Dell Acceleration Appliance for Databases.

Figure A-1. Front view of DAAD



DAAD platform: Rear panel

Figure A-2 shows the rear-panel view of the Dell Acceleration Appliance for Databases.

Figure A-2. Rear view of DAAD



Split-function ports for InfiniBand/SRP and iSCSI

For increased redundancy or high-availability, when using two Mellanox ConnectX-3 dual-port adapters for both connectivity between HA DAADs and fabric connectivity to the initiator nodes (as when running SRP/IB or iSCSI), it is best to split the functionality between the cards. This allows each card to be used for both a redundant connection to the partner node and to the fabric. That way, if one adapter fails, and both its ports are lost, the system can continue to run. The mode will be partially degraded, but not system-failed, with the remaining cluster interconnect and iSCSI or InfiniBand/SRP ports on the other adapter.



Figure A-3. HA configuration with split-port functionality

It is important to use the correct ports for fabric and DAAD interconnectivity in this case. The diagram that follows, along with the rear-view picture of the DAAD chassis shown previously, describes the ports to be used to connect DAADs, and the ports to be used when connecting to the fabric.

NOTE: While split-port functionality is recommended for iSCSI, it is mandatory for InfiniBand/SRP.

In the example here, slots 1 and slot 3 use one port for HA cluster interconnect. The other ports on Slots 1, 2, and 3 are iSCSI ports.

NOTE: Note that the cluster interconnect protocol runs over the Ethernet ports on the InfiniBand HCA.

r10i41 10.10.10	.41		r10i42 10.10.10.42	<u>Details</u>			
SLOT 0 Broadcom	SLOT 1 Mellanox Technologies	SLOT 2 Mellanox Technologies	SLOT 3 Mellanox Technologies	SLOT 4 ioDrive	SLOT 5 ioDrive	SLOT 6 ioDrive	SLOT 7 ioDrive
• • •	:	:	:	•	•	•	•

Figure A-4. ConnectX-3 cluster interconnect card

