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XJ3000-4243 Mezzanine SSG JBOD Functionality Test Report

Formal Release

Initiated by	Reviewed by	Approved by
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Originate Date	Revision	Release Status
2013/1/28	A2	Formal Release

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Revision History

Revisions

REV.	DESCRIPTION	DATE	Engineer
A1	4U24-2 XJ3000-4U243 Mezzanine SSG JBOD Functionality Test Mezzanine Board: B47-MSO9AXXX00A300 Rev: A3 Backplane Board: B40-4ATKXMX00B000 Rev: B0 Repeater Board: B44-87XB4-XX00C010 Rev: C0 Firmware Version: 1.11.1.1 MFG Version: 1.1.0.3 1. Hardware Change SAS and Power of Bead, P/N from B47-MSO9AXXX00A20B to B47-MSO9AXXX00A300 2. Improve signal and Change the text descriptor for Array Device from "ArrayDeviceYY" to "DiskZZZ" where YY is the slot ID in hexadecimal from and ZZZ is the slot ID decimal form. MFG Version from 1.1.0.2 to 1.1.0.3	2012/12/22	Jeffery Lu
A2	4U24-2 XJ3000-4U243 Mezzanine SSG JBOD Functionality Test Mezzanine Board: B47-MSO9AXXX00A300 Rev: A3 Backplane Board: B40-4ATKXMX00B000 Rev: B0 Repeater Board: B44-87XB4-XX00C010 Rev: C0 Firmware Version: 1.11.1.3 MFG Version: 1.1.0.3 1. Resolve the issue that the temperature settings in MFG can not be updated into MCU for smart fan control while powering up both of Expander and MCU. Firmware Version from 1.11.1.1 to 1.11.1.3.	2013/1/28	Jeffery Lu

If product change or information change/update, the report will be revised and released next edition.

Date of Test:	
Test Started	Test Completed
2013/1/25	2013/1/28

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1 Introduction

1.1 Scope

This document is for demonstrating product conformance in the Various Development Phases of a project.

1.2 Purpose

Provide a formal and consistent process for measuring and validation the reliability of a given design. Identify any design discrepancies or electrical, mechanical, firmware and system issues.

1.3 Reference Information

The following documents form a part of this test plan to the extent specified herein.

- DVT Requirements Document
- Current Hardware Platform Evaluation Test Plan

Owner	Document List Review
PM	Application form for DVT functionality validation
PM	Product specification
EE1	Product EVT test report
QT	Board level compatibility EVT test report
EE1	PCB Schematic / Layout

2 Plan of Action Reference

2.1 Plan of Action Procedure

- Refer to this document or other identified specification to start product testing.
- Identify all necessary requirements and equipment for the test.
 - All equipment must be calibrated on an annual basis. Documentation of the calibration must be available.
 - Proper maintenance of equipment is required.
- Complete testing according to instructions or procedures contained in this document.
- Identify whether or not product or product component passes or fails.
- Report all test results to DQA designated personnel and database.
 - Within the Problem Tracking System, the function test shall be referenced in the short description of the issue.
- The EE design teams have the responsibility to resolve all issues and concerns by PVT date.
- Identified issues and concerns will be worked in order of priority and resolved according to the mechanical checklist and any associated documented specifications.
- The QAE team may identify resolution for an issue regarding a product in the design process, if it is deemed necessary for the QAE team to be involved.

2.2 Test Reporting

Throughout the process of development, all progress in testing must be tracked and communicated to the DQA weekly.

Each test shall be tracked as follows:

Definition	Description
Pass	All units were able to complete testing within the specified Pass Criteria
Fail	JUT were not able to complete testing within the specified Fail Criteria
Bug	Unable to predict potential problems
Pending	Test initially failed but is able to pass after fixes were implemented

All Pass/Fail data results must be repeatable.

3 Product Specification

3.1 Product Features

Title	XJ3000-4243S Standard JBOD
	XJ3000-4243S Entry-Level SAS/SATA 6G JBOD Series
Features	24*6G SAS/SATA hard disk bays with lock
	3*hot-swap fans
	Hot-swap 600W 12V high-efficiency redundant power supply module
	2*24Gb/s Mini SAS ports with single expander
	Serial port for console monitoring

3.2 Product Specifications

GENERAL

Number of Expander	Single/Dual
Expander Chip	LSISAS2x36
Host Interface	Mini SAS 4x connector
Expansion Interface	Mini SAS 4x connector
Transfer Speed	2,400MB/s per connector

DRIVES SUPPORTED

Drive Interface	3.0/6.0 Gb dual ported SAS 1.5/3.0/6.0 Gb single ported SATA
Drive RPM	Up to 15,000
Form Factor	3.5", 1"height

ADMINISTRATION / MANAGEMENT

Admin/Firmware Upgrade	In-band & Out-of-band Serial port via Hyperterminal
LED Indicators, Alarm	Yes

HOT-SWAP & REDUNDANCY

Disk Drive	Hot-swap 24-bay
Cooling	3 x hot-swap fans
Power Supplies	600W 1+1 hot-swap redundant 80+ (Silver)
Power Entry	Dual AC Inlet

ELECTRICAL & ENVIRONMENTAL

Universal A/C Input	100~240V AC full range
Operating Environment	Temperature 0°C to 35°C, Relative humidity 20% to 80%
Non-operating Environment	Temperature -20°C to 60°C, Relative humidity 10% to 90%

PHYSICAL SPECIFICATION

Dimensions (W x D x H)	mm	482.6 x 482.1 x 177
	inches	19x19x7
Packaging Dimension (W x D x H)	mm	600 x 730 x 376
Mounting Option	Adjust plate or 20" tool-less rail (optional)	

3.3 DUT 45° Photo



4 DUT Images



Front Angle



Top Open Angle



Rear Angle

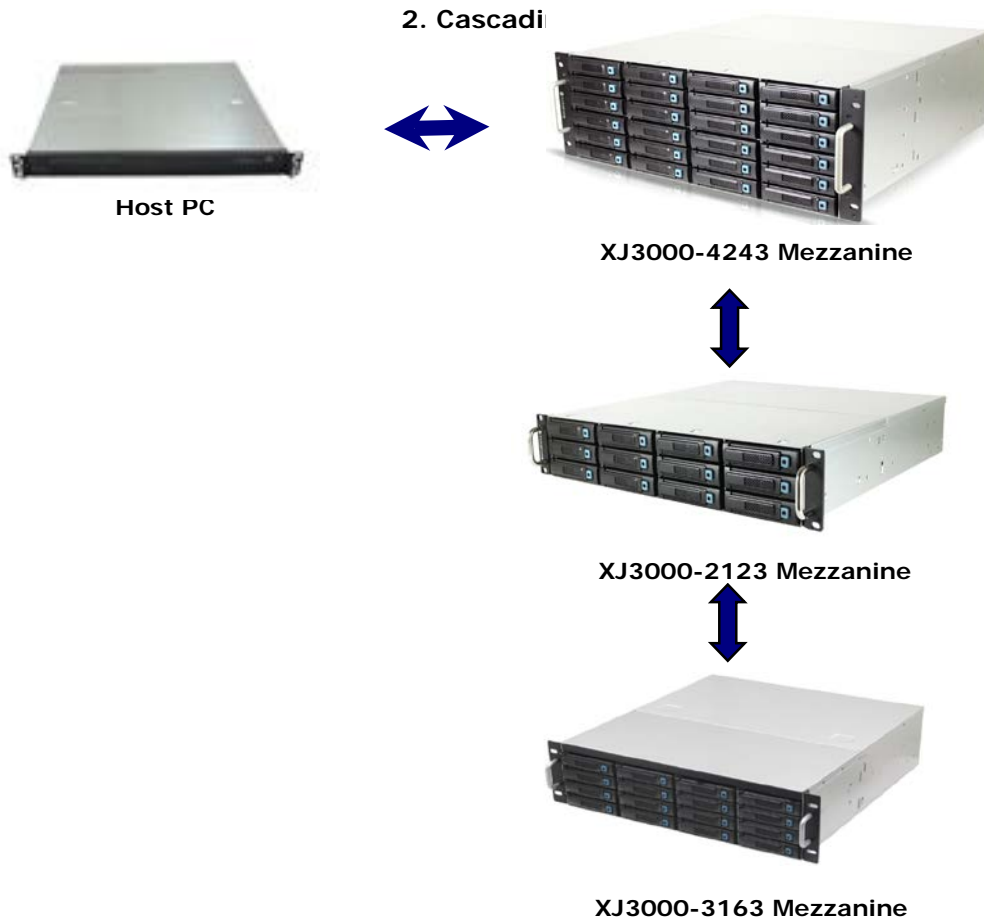
5 Target Device Configuration and Environment

5.1 Test Device Configuration Diagram

1. Single Host



2. Cascading



5.2 Table of Test Configuration

Host Configuration					
Item		Vender / Model		Detail	
Mortherbord		AIC Aquarius ver.D		Motherboard of the host	
Operation System		Microsoft Windows		Server 2003 Entrprise Edition	
CPU		Intel		Xeon 2.33GHz *1	
Memory		DSL		KVR66702S8P5 /512 1.8V *4	
Hard Disk Drive		Seagate / ST9160511NS		SATA HDD / 160GB *1	
HBA/ RAID Card Configuration					
Card	Vender / Model	Firmware ver.	BIOS ver.	Driver ver.	GUI Software ver.
HBA Card	LSI 9205-8e	14.00.00.00	07.27.00.00	2.0.55.0	12.05.03.00
RAID Card	Intel RS2PI008	2.130.03-1332	3.20.00_4.11.05.00	5.2.103.0	11.06.00.0300
XJ3000-4243S JBOD HDD Configuration					
Vender / Model		Interface		Detail	
WD/WDCW1003FBYX0		SATA 3G		1T	
Hitachi / HitachiHUS72403		SATA 6G		3T	
SEAGATE/ST3146854SS		SAS 3G		136G	
Hitachi / HUS154545VLS300		SAS 3G		450GB	
WD/WD1000FYYG01A21		SAS 6G		1T	
Hitachi / HUS156060VLS600		SAS 6G		600G	
SEAGATE/ST1000NM0001		SAS 6G		1T	

5.3 DUT Main Hardware Configuration

Item	Product Number	Quantity	Detail				
Backplane board	B40-4ATKXMX00B000	1	4U24 Mezzanine 6G JBOD				
Power Housing	Zippy R2G-5600V4V	1	AC INPUT:100-240V 47-63Hz 9-4A DC OUTPUT:600W(MAX)				
Power Module	Zippy GIN-3600V	2	AC INPUT:100-240V 47-63Hz 9-4A				
Mezzanine board	B47-MSO9AXXX00A300	1	Mezzanine board				
Fan Module	SUNON PSD1206PMB1-A	4	DC 12V/ 9.8W				
<table> <tr> <td>AIC</td><td>AIC Inc.</td><td colspan="2">REV A2 Page 10 of 20</td></tr> </table>				AIC	AIC Inc.	REV A2 Page 10 of 20	
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6 Functional Test

Test Engineer	Jeffery Lu					
Model Name	XJ3000-4U243 Mezzanine					
Firmware	1.11.1.3					
MFG	1.1.0.3					
Microchip PIC24 Firmware	11					
Mezzanine Board	B47-MSO9AXXX00A300	Rev	A3	S/N	505-10122400110013	
Backplane Board	B40-4ATKXMX00B000	Rev	B0	S/N	421-10121404410029	
RAID Card	Intel(R) RAID RS2PI008			Driver	5.2.130.0	
Power Housing	Zippy R2G-5600V4V AC INPUT:100-240V 47-63Hz 9-4A DC OUTPUT:600W(MAX)					
Power Module	Zippy GIN-3600V AC INPUT:100-240V 47-63Hz 9-4A					

Item Test	Power Module		
Test Procedure			Result
Hot swap the power module and power cord, confirm the right side of functions are work normally.	Hot-swap PSU under power on state, check fail led, beeper, and console status.		Pass
	Power cord interrupt, check fail led, beeper, and console status.		Pass
	PSU status under GUI		Pass
	PSU status under console		Pass

Item Test	Shake Test		
Test Procedure			Result
When powering up the enclosure and then used SAS Cable plug in backplane connector, then gently shake SAS Cable connector, check if PHY status is normally.	Bend the SFF-8088 cable.		Pass
	Shaking cable around the junction.		Pass

Item Test	LED Color of Front Panel		
Test Procedure			Result
Check LED color of front panel.	Power Fail LED		Blue
	Temperature Alarm LED		Red
	Fan Alarm LED		Red

Item Test	System FAN	
Test Procedure		Result
Hot swap or start/ stop the FAN module, and confirm the right side of functions are work normally.	How-swap fan under power on state, check fail led, beeper, GUI, and console status.	Pass
	Fan status under GUI	Pass
	Fan status under console	Pass
	Smart Fan, if temperature upgrade, the rotational speed of fan was increased.(depend on spec.)	Pass
Item Test	Voltage Sensor	
Test Procedure		Result
To check if value of the voltage from the specific function showing the status is ok.	Check voltage under Hyperterminal status.	Pass
	Check voltage under GUI	Pass
Item Test	HDD Bays	
Test Procedure		Result
Insert all HDDs into all disk bays, then hot swap some HDDs, and check all HDDs tray's activity/ data access LED,and RS-232 console status is normal. HDDs could be SAS/SATA interface. The right side of list are the HDD configuration.	SAS HDDs	Pass
	SATA HDDs	Pass
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Item Test	Expander	
Test Procedure		Result
Check channel of expander that function is ok.	Hot-swap expander board under power on status, and expander board could on-line automatically.	Pass
	Check PHY state and negotiated link speed, confirm the PHY contents conform with actual HDD configuration	Pass
	Up connector is substrate type.	Pass
	Down connectors were table type.	Pass
Item Test	SAS Zoning	
Test Procedure		Result
Applying SAS Zoning function to segment HDD group, and obtain benefit of dual host that could connect the same JBOD simultaneously.	Group8 and Group9 were run independently.	Pass
	Group1 can detect Group8 and Group9.	Pass
	Take HDD for Group8, and all HDD of Group8 could build RAID and run Iometer.	Pass
	Take HDD for Group9, and all HDD of Group9 could build RAID and run Iometer.	Pass
Item Test	Band Width	
Test Procedure		Result
Using SFF-8088 to connect dual external ports that were designed on the same RAID card, other side was connecting with JBOD.	When Iometer was keep on running, then remove one SFF-8088, the performance would be decreased, but RAID is still living.	Pass
	Although one SFF-8088 cable was removed, and RAID volume still lives	Pass
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Item Test	Temperature Sensor	
Test Procedure		Result
When temperature sensor \geq designated degree, the GUI will spring up warning message, and fan speed from the RS232 console showing the status is normal.	T1, T2, warning, Alarm value configuration setting	Pass
	Temperature detected status under GUI	Pass
	Temperature detected status under Hyperterminal	Pass
	Break through T1 value, the rotational speed of fan was increased	Pass
	Break through alarm value, then the fail led will light up	Pass
	Break through alarm value, beep from buzzer	Pass
	Break through alarm value, RPM of fan is the highest	Pass
Item Test	Firmware upgrade	
Test Procedure		Result
To upgrade the firmware then check if upgrade successfully.	In band mode(debug port)	Pass
	Out-of-band mode(console port)	Pass
Item Test	Burn-in Test	
Test Procedure		Result
Using performance assessment tool, let JBOD status was maintain full loading on 24~72 hours. No any error message was showed.	Adjust conf. to 100% read	Pass
	Adjust conf. to 100% write	Pass
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Item Test	Mute Button	
Test Procedure		Result
When the warning sound was activated, press the mute button could stop this sound.	Hot swap the power module	Pass
	Hot swap the fan module	Pass
	Temperature was detected over default alarm value(over 55 degrees centigrade).	Pass
Item Test	Cascading	
Test Procedure		Result
To cascade the SAS JBOD device, check if Enclosure Name and SAS HDDs can be detect, create/ rebuild/ delete a RAID and doing I/O access is ok.	A host cascaded this 4U24 Mezzanine, then the 2U24 Mezzanine,the 3U16 Mezzanine last layer.(Total 3 Layer)	Pass
	A host cascaded this 3U16 Mezzanine , then the 2U24 Mezzanine,the 4U24 Mezzanine last layer.(Total 3 Layer)	Pass
Item Test	SES Lighting Signal	
Test Procedure		Result
To verify SES lighting signal, using sg3_utils tool to check lighting mode of each status is correct.	Request consistency check in progress	Pass
	Request in critical array	Pass
	Request in failed array	Pass
	Request rebuild/ remap	Pass
	Request rebuild/ remap aborted	Pass
	Request device missing indication	Pass
	Request insert	Pass
	Request removal	Pass
	Request identify	Pass
	Request fault indication	Pass
Item Test	SFF-8088 External Port	
Test Procedure		Result
Check SFF-8088 external ports from JBOD were 3G/S connector or 6G/S connector.	Up port	6G/S
	Down port	6G/S
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7 RAID Card Test

Test Engineer	Jeffery Lu				
Model Name	XJ3000-4U243 Mezzanine				
Firmware	1.11.1.3				
MFG	1.1.0.3				
Mezzanine Board	B47-MSO9AXXX00A300	Rev	A3	S/N	505-10122400110013
Backplane Board	B40-4ATKXMX00B000	Rev	B0	S/N	421-10121404410029
RAID Card	Intel(R) RAID RS2PI008			Driver	5.2.130.0
HDD Type	WD/WDCW1003FBYX0 Hitachi / HitachiHUS72403 SEAGATE/ST3146854SS Hitachi / HUS154545VLS300 WD/WD1000FYYG01A21 Hitachi / HUS156060VLS600 SEAGATE/ST1000NM0001				
Power Housing	Zippy R2G-5600V4V AC INPUT: 100-240V 47-63Hz 9-4A DC OUTPUT: 600W(MAX)				
Power Module	Zippy GIN-3600V AC INPUT: 100-240V 47-63Hz 9-4A				

RAID Function	Test Procedure	Result
Intel(R) RAID RS2PI008 RAID Function	Create/Remove a RAID 0 volume(Secondary Mezzanine)	FAIL
	Create/Rebuild/Remove a RAID 1 volume	Pass
	Create/Rebuild/Remove a RAID 5 volume	Pass
	Create/Rebuild/Remove a RAID 6 volume	Pass
	Create/Remove a RAID 00 volume	Pass
	Create/Rebuild/Remove a RAID 10 volume	Pass
	Create/Rebuild/Remove a RAID 50 volume	Pass
	Remove a crashed RAID 0 volume	Pass
	Remove a crashed RAID 1 volume	Pass
	Remove a crashed RAID 5 volume	Pass
	Remove a crashed RAID 6 volume	Pass
	Remove a crashed RAID 00 volume	Pass
	Remove a crashed RAID 10 volume	Pass
	Remove a crashed RAID 50 volume	Pass

8 HBA Card Test

Test Engineer	Jeffery Lu						
Model Name	XJ3000-4U243 Mezzanine						
Firmware	1.11.1.3						
MFG	1.1.0.3						
Mezzanine Board	B47-MSO9AXXX00A300	Rev	A3	S/N	505-10122400110013		
Backplane Board	B40-4ATKXMX00B000	Rev	B0	S/N	421-10121404410029		
RAID Card	LSI 9205-8e			Driver		2.0.55.0	
HDD Type	WD/WDCW1003FBYX0 Hitachi / HitachiHUS72403 SEAGATE/ST3146854SS Hitachi / HUS154545VLS300 WD/WD1000FYYG01A21 Hitachi / HUS156060VLS600 SEAGATE/ST1000NM0001						
Power Housing	Zippy R2G-5600V4V AC INPUT:100-240V 47-63Hz 9-4A DC OUTPUT:600W(MAX)						
Power Module	Zippy GIN-3600V AC INPUT:100-240V 47-63Hz 9-4A						
Other							

HBA Function	Test Procedure	Result
LSI 9205-8e SAS HBA Card	While using LSI 9205-8e SAS HBA to connect with XJ3000-4243S Mezzanine on Board SAS JBOD. Then check if all hard drives can be detect by LSI BIOS utility.	Pass
	While using LSI 9205-8e SAS HBA to connect with XJ3000-4243S Mezzanine on Board SAS JBOD. Then check if all hard drives can be detect by LSI MSM.	Pass
	While using 9205-8e SAS HBA to connect with XJ3000-4243S Mezzanine on Board SAS JBOD. Then check if all hard drives can be detect by OS Disk management.	Pass

9 Output Power

Test Engineer	Jeffery Lu				
Model Name	XJ3000-4U243 Mezzanine				
Firmware	1.11.1.3				
MFG	1.1.0.3				
Mezzanine Board	B47-MSO9AXXX00A300	Rev	A3	S/N	505-10122400110013
Backplane Board	B40-4ATKXMX00B000	Rev	B0	S/N	421-10121404410029
RAID Card	Intel(R) RAID RS2PI008			Driver	5.2.130.0
HDD Type	WD/WDCW1003FBYX0 Hitachi / HitachiHUS72403 SEAGATE/ST3146854SS Hitachi / HUS154545VLS300 WD/WD1000FYYG01A21 Hitachi / HUS156060VLS600 SEAGATE/ST1000NM0001				
Power Housing	Zippy R2G-5600V4V AC INPUT: 100-240V 47-63Hz 9-4A DC OUTPUT: 600W(MAX)				
Power Module	Zippy GIN-3600V AC INPUT: 100-240V 47-63Hz 9-4A				
Other					

◆Power on - Boot sequency: Measure the maximum current value of between JBOD power on and boot-up to console. (Plug- in the SAS HDD to all HDD Bays)

◆Idle mode: Measure the current value when JBOD without all HDD Bays.

◆Max. load: Measure the maximum current value which JBOD under maximum loa

Voltage /Condition	Power on - Boot Procedure	Idle Mode	Max. load
AC	4.8A	2.96A	3.09A
Total (Watt)	528W	325.6W	339.9W
+12V	37.02A	18.29A	18.34A
+5V	15.06A	15.31A	18.08A
Total (Watt)	519.54W	296.03W	310.48W

10 Basic PSU Verification

Model Name	XJ3000-4243S Mezzanine
Power Housing	Zippy R2G-5600V4V AC INPUT: 100-240V 47-63Hz 9-4A DC OUTPUT: 600W(MAX)
Power Module	Zippy GIN-3600V AC INPUT: 100-240V 47-63Hz 9-4A

Item	Comment		Result
Alarm Reset Button	Hot swap the PSU0's power cord and check if audio alarm (buzzer sound)		Pass
	Hot swap the PSU1's power cord and check if audio alarm (buzzer sound)		Pass
Check Output Voltage	Output Voltage	SPEC.	
	+5V	4.75V ~5.25V	5.104V
	+12V	11.4V~12.60V	12.10V
	-12V	-11.4V ~ -12.60V	n/a
	-3.3V	3.13V~3.47V	n/a
	+5VSB	4.75V ~5.25V	n/a
Short Circuit	+3.3V	The power supply shall be latched in case any short circuit is taken place at +12V,-12V,+3.3V,+5V output	n/a
	+5V		Pass
	-12V		n/a
	+12V		Pass

11 Summary

Item	Descriptions	Result
Enclosure Function Test	Power Module	Pass
	Shake Test	Pass
	LED Color of Front Panel	Pass
	System FAN	Pass
	Voltage Sensor	Pass
	HDD Bays	Pass
	Expander	Pass
	SAS Zoning	Pass
	Band Width	Pass
	Temperature Sensor	Pass
	Firmware upgrade	Pass
	Burn-in Test	Pass
	Mute Button	Pass
	Cascading	Pass
	SES Lighting Signal	Pass
	SFF-8088 External Port	Pass
RAID Function Test	Intel(R) RAID RS2PI008 RAID CARD	FAIL
HBA Function Test	LSI 9205-8e SAS HBA	Pass

** Notes: Test items and test contents depend on spec.

Bug List

Class

A	Major
B	Minor
C	Limitation
D	Other(Suggestion)

NO.	Date	Class	Bug/Limitation/Suggestion	Initiator	Status	Solution
1	2012/11/15	A	The show "CDB" error messages. Under Secondary Mezzanine, when HDDs were doing RAID 0 and I/O Meter,	Jeffery	Open	