



AIC Inc.
No. 152, Sec.4, Linghang N. Rd,
Dayuan District, Taoyuan City
Taiwan 337
T: +886-3-433-9188
F: +886-3-287-1818
www.aicpc.com

[Test Report Title]

Compatibility Test

[J2024-06/ XJ1-20246-XX]

Date 2022/04/15
Doc. Number CD220415A0
Doc. Version A0
Number of Pages 12
Test Report Perform By DQA Team

Approved By	Reviewed By	Tested By
<div><div>SDRD</div><div>'22.05.28</div><div>Pozar Lee</div></div>	<div><div>DQA</div><div>2022.04.20</div><div>Scott Lin</div></div>	<div><div>DQA</div><div>'22.04.15</div><div>Johnny Lin</div></div>


Revision History									
REV.	DESCRIPTION	DATE	Engineer						
A0	2U24-06-12G SAS JBOD Compatibility 2U24-06-JBOD All Firmware Version: Expander: BMC-> 1.04.2(Feb 14 2022 04:06:50 UTC) F/W-> 1:12:59:3 MFG-> 1:59:0:3 Backplane: CPLD-> 1.0.HOTSWAP_2U24 New AVL HDD: Seagate / ST1200MM0018 Seagate / ST1800MM0018 TOSHIBA/PX02SMF020 Hitachi / HUC109090CSS600 WD / WD3000BKHG	2022/04/15	Johnny Lin						
<table><tr><th colspan="2">Date of Test:</th></tr><tr><td>Test Started</td><td>Test Completed</td></tr><tr><td>2022/03/21</td><td>2022/04/15</td></tr></table>				Date of Test:		Test Started	Test Completed	2022/03/21	2022/04/15
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1. Target Device Configuration and Environment					
1.1 Table of Test Configuration					
Host Configuration					
Item		Vender / Model		Detail	
Motherboard		Intel S2600CP		Motherboard of the host	
Operation System1		Microsoft Windows		Server 2016 Datacenter	
Operation System2		CentOS7.4 x64		3.10.0-693.11.1.el7.x86_64	
CPU		Intel		Xeon X5677 3.47GHz * 1	
Memory		Micron		8GB DDR3-1600 * 1	
Hard Disk Drive		Seagate / ST9160511NS		SATA HDD / 160GB *1	
RAID/HBA Card Configuration					
Card	Vender / Model	Firmware ver.	BIOS ver.	Driver ver.	GUI ver.
12G RAID	Broadcom /9580-8i8e	5.160.02-3415	7.16.00.0_0x7100500	7.716.03.0	LSA 7.716.03.0 2020/09/21
12G HBA	Broadcom /9302-16e	15.00.00.00	08.35.00.00	2.51.12.80	NA
6G HBA	LSI /9206-16e	19.00.00.00-IT	7.37.00.00	2.0.79.80	NA
HDD Configuration					
Vender / Model		Interface		Detail	
Seagate / ST1200MM0018		SAS-12G		Capacity:1.2TB , F/W:E002	
Seagate / ST1800MM0018		SAS-12G		Capacity:1.8TB , F/W:E002	
TOSHIBA/PX02SMF020		SAS-12G		Capacity:200GB , F/W:0205	
Hitachi / HUC109090CSS600		SAS-6G		Capacity:900GB , F/W:A2D0	
WD / WD3000BKHG		SAS-6G		Capacity:300GB , F/W:VG04	
1.2 JBOD Main Hardware Configuration					
Item		Product Number		Quantity	Detail
Backplane board		AIC / 504-21040100510009		1	BP-HD2H18-TY BBP-HD20033A_A01 A/W: HD2H18-TY-A1
Expander board		AIC / 504-21041300110006 504-21041300210049		2	DB-EXXPD26-TY BDB-EXP0020AB01 A/W:EXPD26-TY-B0
Power Module		AcBel		2	Model:R1CA2551B Option: P00C,Rev: A03 Fru:APM12V0101 SN:
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			FSF059A0300CGB2108000028 FSF059A0300CGB2108000334
SKU :			
Expander Firmware	1:12:59:3		
MFG	1:59:0:3		
BMC	1.04.2(Feb 14 2022 04:06:50 UTC)		
CPLD	1.0.HOTSWAP_2U24		

2. RAID Card Compatibility Test

RAID Card	"RAID Card"
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2.1 "RAID Card" with SAS 12G HDD Config

SAS 12G configuration			
RAID Function	Test Procedure	Criteria	Result
"RAID Card"	Create a RAID 0 volume	The RAID function can work properly.	Pass
	Create a RAID 1 volume		Pass
	Create a RAID 5 volume		Pass
	Remove a RAID 0 volume		Pass
	Remove a RAID 1 volume		Pass
	Remove a RAID 5 volume		Pass
"RAID Card"	Rebuild a RAID 1 volume	The RAID function can work properly	Pass
	Rebuild a RAID 5 volume		Pass
	Full initialization a RAID 0 volume		Pass
	Full initialization a RAID 1 volume		Pass
	Full initialization a RAID 5 volume		Pass

2.2 "RAID Card" with SAS 6G HDD Config

SAS 6G configuration			
RAID Function	Test Procedure	Criteria	Result
"RAID Card"	Create a RAID 0 volume	The RAID function can work properly.	Pass
	Create a RAID 1 volume		Pass
	Create a RAID 5 volume		Pass
	Remove a RAID 0 volume		Pass
	Remove a RAID 1 volume		Pass
	Remove a RAID 5 volume		Pass
"RAID Card"	Rebuild a RAID 1 volume	The RAID function can work properly.	Pass
	Rebuild a RAID 5 volume		Pass
	Full initialization a RAID 0 volume		Pass
	Full initialization a RAID 1 volume		Pass
	Full initialization a RAID 5 volume		Pass

2.3 "RAID Card" with SATA 6G HDD Config

SATA 6G configuration			
RAID Function	Test Procedure	Criteria	Result
"RAID Card"	Create a RAID 0 volume	The RAID function can work properly.	Pass
	Create a RAID 1 volume		Pass
	Create a RAID 5 volume		Pass
	Remove a RAID 0 volume		Pass
	Remove a RAID 1 volume		Pass
	Remove a RAID 5 volume		Pass
"RAID Card"	Rebuild a RAID 1 volume	The RAID function can work properly	Pass
	Rebuild a RAID 5 volume		Pass
	Full initialization a RAID 0 volume		Pass
	Full initialization a RAID 1 volume		Pass
	Full initialization a RAID 5 volume		Pass

2.4 Test Procedure

NO.	Description
1	Use RAID Card to connect JBOD via SAS/SATA cable.
2	Use a serial console cable to connect to the console port of JBOD.
3	Check if the Firmware/BIOS of RAID Card is the latest version, then to upgrade if not.
4	<p>Create/Rebuild/Remove RAID 0/1/5 , check status as follows:</p> <ul style="list-style-type: none"> - Check if the HDD LED is normal - Check the RAID Card GUI for error logs (CDB information) - Check if there is an error in the Serial console "counters" (After plug-in and out the hard disk, there must be cleared the log first and do the "counters reset" first). - Check if the HDD (PHY) link speed is reduced. - Check if the HDD status of Windows Device Manager and Disk Manager is normal. - Run IOMeter burn in test (RAID 0/1/5)100GB with full Initialization: <p>Test configuration:</p> <ul style="list-style-type: none"> -- worker: 1 -- Sequential Read / Write : 100% -- Test Time: 3 minute -- Transfer Request Size(Bytes) : 4K , 512K -- Outstanding I/O: 1 ,2, 4, 8,16, 32
5	<p>Check serial console command:</p> <ul style="list-style-type: none"> -rev <--> Check JBOD firmware version -showmfg <--> Check JBOD MFG version -phyinfo <--> Check PHY status -sensor <--> Check FAN/Temperature/Power/Voltage status

	-phyzone state <--> Check zone state
6	Hot swap FAN/Power/HDD to correspond with step 5 and RAID Card GUI Enclosure option to view related status.
7	Serial console changes T1, T2 temperature settings to correspond with step 5 and RAID Card GUI Enclosure option to check the related status. Ex : > temperature 1 18 52 48 54 > reset
8	Zoning function test - console command “ phyzone on” , and “ reset ”. - Split HDD PHY to group (group 8 /9) , ex : phyzone 4 8 - Set the Up-link PHY group to 8/9 in stages and connect to test whether the zoning function is normal. - When connecting to group 8/9 respectively, run IOMeter burn in test for 10 minutes. (RAID 5, 100GB, Full Initialization, Transfer size: 512k , Sequence Read/Write :100%)
9	JBOD cascade test - Prepare another JBOD for cascade test. - Create/Rebuild/Remove RAID 5. - According to step 4, check the relevant status. - Run IOMeter burn in test for 10 minutes. (RAID 5, 100GB, Full Initialization, Transfer size: 512k , Sequence Read/Write :100%)

2.5 RAID Card Compatibility Test Check List

NO.	Test Items	Result
1	Cascade another SAS JBOD *1	Pass
2	PHY Zone function	Pass
3	SES Enclosure fan/power/temp test	Pass
4	Create/Rebuild/Remove a RAID 0 / 1 / 5 (100GB / Full Initialization)	Pass
5	Console and GUI log check	Pass
6	Device Manager and Disk Manager check device and partition	Pass
7	IOMeter burn in test (RAID 0, 1, 5 / 100GB / Full Initialization)	Pass

*1: Check HDD Locate, Access, Fail, Rebuild (Hot spare) RAID Led status and make record.

3. HBA Card Compatibility Test

HBA Card	"HBA Card"
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3.1 "HBA Card" with SAS 12G HDD Config

SAS 12G configuration			
HBA Function	Test Procedure	Criteria	Result
"HBA Card"	Perform "HBA Card" BIOS utility to verify HDD information.	All hard drives can be detected by "HBA Card" BIOS utility.	Pass
	Perform Disk management of OS to verify HDD information.	All hard drives can be detected by OS Disk management.	Pass

3.2 "HBA Card" with SAS 6G HDD Config

SAS 6G configuration			
HBA Function	Test Procedure	Criteria	Result
"HBA Card"	Perform "HBA Card" BIOS utility to verify HDD information.	All hard drives can be detected by "HBA Card" BIOS utility.	Pass
	Perform Disk management of OS to verify HDD information.	All hard drives can be detected by OS Disk management.	Pass

3.3 "HBA Card" with SATA 6G HDD Config

SATA 6G configuration			
HBA Function	Test Procedure	Criteria	Result
"HBA Card"	Perform "HBA Card" BIOS utility to verify HDD information.	All hard drives can be detected by "HBA Card" BIOS utility.	Pass
	Perform Disk management of OS to verify HDD information.	All hard drives can be detected by OS Disk management.	Pass

3.4 Test Procedure

NO.	Description
1	Use HBA Card to connect JBOD via SAS/SATA cable.
2	Use a serial console cable to connect to the console port of JBOD.
3	Check if the Firmware/BIOS of HBA Card is the latest version, then to upgrade if not.
4	Install all HDD , check status as follows: - Check if the HDD LED is normal

	<ul style="list-style-type: none"> - Check if there is an error in the Serial console "counters" (After plug-in and out the hard disk, there must be cleared the log first and do the "counters reset" first). - Check if the HDD (PHY) link speed is reduced. - Check if the HDD status of Windows Device Manager and Disk Manager is normal. - Run IOMeter burn in test (Physical drive): Test configuration: -- worker: 1 -- Sequential Read / Write : 100% -- Test Time: 3 minute -- Transfer Request Size(Bytes) : 4K , 512K -- Outstanding I/O: 1 ,2, 4, 8,16, 32
5	<p>Check serial console command:</p> <ul style="list-style-type: none"> -rev <--> Check JBOD firmware version -showmfg <--> Check JBOD MFG version -phyinfo <--> Check PHY status -sensor <--> Check FAN/Temperature/Power/Voltage status -phyzone state <--> Check zone state
6	Hot swap FAN/Power/HDD to correspond with step 5 and HBA Card GUI (if HBA card GUI is provided) Enclosure option to view related status.
7	<p>Serial console changes T1, T2 temperature settings to correspond with step 5 and HBA Card GUI Enclosure option to check the related status (if HBA card GUI is provided).</p> <p>Ex :</p> <p>> temperature 5 10 15 20</p> <p>> reset</p>
8	<p>Zoning function test</p> <ul style="list-style-type: none"> - Console command " phyzone on" , and " reset ". - Split HDD PHY to group (group 8 /9), ex : phyzone 4 8 - Set the Up-link PHY group to 8/9 in stages and connect to test whether the zoning function is normal. - When connecting to group 8/9 respectively, run IOMeter burn in test for 10 minutes. (RAID 5, 100GB, Full Initialization, Transfer size: 512k , Sequence Read/Write :100%)
9	<p>JBOD cascade test</p> <ul style="list-style-type: none"> - Prepare another JBOD for cascade test. - According to step 4, check the relevant status. - Run IOMeter burn in test for 10 minutes. <p>(Physical drive,, Transfer size: 512k , Sequence Read/Write :100%)</p>

3.5 HBA Card Compatibility Test Check List

NO.	Test Items	Result
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1	Hot Swap HDD test	Pass
2	Cascade another JBOD	Pass
3	PHY Zone function	Pass
4	Console log check	Pass
5	Device Manager and Disk Manager check device	Pass
6	IOmeter burn in test	Pass
*1: Check HDD Locate, Access, LED status and make record (if HBA card GUI is provided).		

4. HDD Compatibility Test

4.1 HDD with HBA Card

HDD Function	Test Procedure	Criteria	Result
"HDD"	Perform "HBA Card" BIOS utility to verify HDD information.	HDD can be detected by "HBA Card" BIOS utility.	Pass
	Perform Disk management of OS to verify HDD information.	HDD can be detected by OS Disk management.	Pass
	After stress test verify enclosure information.	Check Item: (CLI read) counters under expander console	Pass

4.2 Test Procedure

NO.	Description
1	Use HBA Card to connect JBOD via SAS/SATA cable.
2	Use a serial console cable to connect to the console port of JBOD.
3	Check if the Firmware/BIOS of HBA Card is the latest version, then to upgrade if not.
4	Check serial console command: -phyinfo <--> Check PHY status
5	Hot swap HDD to correspond with step 4 and HBA Card GUI (if HBA card GUI is provided) Enclosure option to view related status.
6	Install all HDD , check status as follows: - Check if the HDD LED is normal - Check if there is an error in the Serial console "counters" (After plug-in and out the hard disk, there must be cleared the log first and do the "counters reset" first). - Check if the HDD (PHY) link speed is reduced. - Check if the HDD status of Windows Device Manager and Disk Manager is normal. - Run Iometer burn in test (Physical drive): Test configuration: -- worker: 1 -- Sequential Read / Write : 100% -- Test Time: 3 minute -- Transfer Request Size(Bytes) : 4K , 512K -- Outstanding I/O: 1 ,2, 4, 8,16, 32

4.3 HDD Compatibility Test Check List

NO.	Test Items	Result
1	Hot Swap HDD test	Pass
2	Console log check	Pass
3	Device Manager and Disk Manager check device	Pass
4	IOmeter burn in test	Pass