

IBM® BladeCenter S SAS RAID Module Interoperability Matrix

Section 1 – Hardware Options

BladeCenter Chassis	Type	Required
BladeCenter S (BC-S)	8886 / 1948	Yes

RAID Controller	Option / AAS Feature	Required
SAS RAID Module	43W3584 / 3734	Yes

Management Modules	Option / AAS Feature	Required
Advanced Management Module (AMM)	25R5778 / 3201	Yes

Battery Backup Unit (BBU) - One Per Module	Option / AAS Feature	Required
IBM BladeCenter RAID Battery Backup Module	Part of 43W3584 / NA (part of 3734)	Yes

Disk Storage Module (DSM) - One DSM is required	Option / AAS Feature	Required
Disk Storage Module (Disk Drives: 6 x 3.5")	43W3581 / 4545	Optional

Blade Server	Type	Required
IBM BladeCenter HS12	8014, 8028, 1916	Optional
IBM BladeCenter HS20	8843, 1883	Optional
IBM BladeCenter HS21	8853, 1885	Optional
IBM BladeCenter HS21 XM	7995, 1915	Optional
IBM BladeCenter HS22	7870, 1936	Optional
IBM BladeCenter HS22V	7871, 1949	Optional
IBM BladeCenter HS23	7875	Optional
IBM BladeCenter HS23E	8038, 8039	Optional
IBM BladeCenter HX5	7872	Optional
IBM BladeCenter LS20	8850	Optional
IBM BladeCenter LS21	7971	Optional
IBM BladeCenter LS22	7901	Optional
IBM BladeCenter LS41	7972	Optional
IBM BladeCenter LS42	7902	Optional
IBM BladeCenter JS12	7998	Optional
IBM BladeCenter JS22	7998	Optional
IBM BladeCenter JS23	7778	Optional
IBM BladeCenter JS43	7778	Optional
IBM BladeCenter PS700/701/702	8406-70Y/71Y	Optional
IBM BladeCenter PS703/704	7891-73X/74X	Optional

Note: All levels in this document are minimum required levels or current levels available at the time of publication.

Host SAS Adapter - One required per blade	Option / AAS Feature	Required
SAS Expansion Card (CFFv)	39Y9190 / 8250	Yes, on all supported Legacy Connector PCI-x Blades
SAS Connectivity Card (CIOv)	43W4068 / Varies by blade - See COG	Yes, on HS22/HS22v/HS23/ HX5*
ServeRAID H1135 Controller for IBM Flex System and BladeCenter (CIOv)	90Y4750 / NA	Yes, on HS23E
SAS Connectivity Card (CFFv)	43W3974 / NA	Yes, supported only on HS21XM, HS12 (8028)
SSD Expansion Card for IBM HX5*	46M6908/5765	Yes, only on HX5, also requires 43W4068

Ethernet - One switch is required in "Bay 1"	Option / AAS Feature	Required
Nortel 1/10Gb Uplink Ethernet Switch Module	44W4404 / 1590	Yes
Nortel Layer 2/3 Copper Gb Ethernet Switch	32R1860 / 3212	Yes
Nortel Layer 2/3 Fiber Gb Ethernet Switch	32R1861 / 3213	Yes
Nortel Layer 2/7 Copper Gb Ethernet Switch	32R1859 / 3211	Yes
Cisco Catalyst Switch Module 3012	43W4395 / 3174	Yes
Server Connectivity Module	39Y9324 / 3220	Yes
Nortel 10G Uplink Ethernet Switch	32R1783 / 3210	Yes
Intelligent Copper Pass-thru Module	44W4483 / 5452	Yes

Storage Devices	Option / AAS Feature	FRU	Capacity	Form Factor	Speed
Hot-Swap SAS HDD	43W7523 / 3748	43W7525	73GB	3.5"	15K
Hot-Swap SAS HDD	43W7524 / 3749	43W7526	146GB	3.5"	15K
Hot-Swap SAS HDD	43X0802 / 3747	43X0805	300GB	3.5"	15K
Hot-Swap SAS HDD	44W2234 / 3747	42D0568	300GB	3.5"	15K
Hot-Swap SAS HDD	42D0519 / 3762	42D0520	450GB	3.5"	15K
Hot-Swap SAS HDD	44W2239 / 3762	42D0573	450GB	3.5"	15K
Hot-Swap SAS HDD	44W2244 / 3763	42D0578	600GB	3.5"	15K
Hot-Swap NL SAS HDD	42D0546 / NA	42D0548	750GB	3.5"	7.2K
Hot-Swap NL SAS HDD	42D0547 / NA	42D0549	1TB	3.5"	7.2K
Hot-Swap NL SAS HDD	42D0777 / NA	42D0778	1TB	3.5"	7.2K
Hot-Swap NL SAS HDD	42D0767 / NA	42D0768	2TB	3.5"	7.2K

Note 1: Drives not included in the above list are not supported by IBM.

External SAS Devices	Required
TS2240 Tape Device (Connects to External SAS ports)	Optional
TS2250 Tape Device (Connects to External SAS ports)	Optional
TS2900 Tape Device (Connects to External SAS ports)	Optional
TS2230 Tape Device (Connects to External SAS ports)	Optional
TS2340 Tape Device (Connects to External SAS ports)	Optional
TS3100 Tape Device (Connects to External SAS ports)	Optional

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Section 2 – Supported Operating Systems

Supported Operating Systems	Versions
Red Hat Linux	Enterprise Linux 5.2/5.3/5.4/5.7/5.8/6.1/6.2/6.3 AS & ES for x86/AMD64/EM64T (HS and LS Blades) Enterprise Linux 5.3 minimal is required for HS22 Blades
Novell SUSE Linux	SUSE LINUX Enterprise Server 10.2/10.3/10.4 for x86/AMD64/EM64T SUSE LINUX Enterprise Server 11/11.1/11.2 for x86/AMD64/EM64T
Microsoft Windows	2003 Server Standard (x32/x64), Enterprise (x32/x64) 2008 Server Std/Ent/DC/DC with EBS (x32/x64) 2008 Server R2 Std/Ent/DC (x64 only) 2008 Server R2 SP1 Std/Ent/DC (x64 only)
AIX	6.1 TL3 with Service Pack version 5 6.1 TL4 with Service Pack version 5 6.1 TL6 with Service Pack version 5 6.1 TL7 with Service Pack version 2 7.1 TL0 with Service Pack version 1 7.1 TL0 with Service Pack version 3 7.1 TL1 with Service Pack version 2

Note 1: REQUIRED ACTION - If running a Windows Server 2003-based OS, the following Microsoft Hotfixes are required to be downloaded and installed using the following links:

- <http://support.microsoft.com/kb/941276/en-us>
- <http://support.microsoft.com/kb/934739/en-us>

Note 2: REQUIRED ACTION - If running a Windows Server 2008-based OS, the following Microsoft Hotfixes are required to be downloaded and installed using the following links:

- <http://support.microsoft.com/kb/967349>

Note 3: If running a Red Hat based OS on HS22 Blades, Red Hat Enterprise 5.3 is the minimum supported level.

Note 4: Refer to the Host System Attachment Guide for updated levels and additional information.

- <http://www.ibm.com/systems/support/supportsite.wss/docdisplay?Indocid=MIGR-5078491&brandind=5000020>

Note 5: AIX 7.1 TL0 with SP1 is minimal for using native AIX PCM multipath driver and AIX 7.1 TL0 SP3 is minimal for using AIX SDDPCM multipath driver.

Note 6: When using HS23 and HS23E Blades with 39Y9195, IBM BladeCenter SAS Connectivity Module or 43W3584, IBM BladeCenter S SAS RAID Controller Module, RHEL 5 and SLES 10 are not supported.

Operating System Updates	Updated Version
RedHat Linux 5.2 / 5.3 / 5.4 / 5.7 / 5.8 / 6.1 / 6.2 / 6.3	5.2: 2.6.18-92.el5 / 0.4.7-17.el5; 5.3: 2.6.18-128.el5 / 0.4.7-23.el5; 5.4: 2.6.18-164.el5 / 0.4.7-30.el5; 5.7: 2.6.18-274.el5; 5.8: 2.6.18-308.el5; 6.1: 2.6.32-131.el6; 6.2: 2.6.32-220.el6; 6.3: 2.6.32-279.el6.x86_64
SUSE Linux Enterprise Server 10.2 / 10.3 / 10.4	10.2: 2.6.16.60-0.21/0.4.7-34.38; 10.3: 2.6.16.60-0.54.5 / 0.4.7-34.50; 10.4:
SUSE Linux Enterprise Server 11	11 – 2.6.27.42.-0.1 / 0.4.8-40.6.1; 11.1 – 2.6.32.12-0.7 / 0.4.8-40.21.1; 11.2 - 3.0.13-0.27

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Windows Server 2003 / 2008	Windows 2003: SP2; Windows 2008: SP1 / R2 SP1
AIX	Refer to Note 4 above

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Section 3 – Virtualization Environments

Supported Platforms	Tested Versions
VMWare	ESX Server 3.5u4 (3.5u4 is the minimum required level) ESX Server 4.0 update1 ESX Server 4.0 update3 ESX Server 4.1 ESX Server 4.1 update1 ESX Server 4.1 update2 ESXi 4.0 update1 ESXi 4.0 update3 ESXi 4.1 update1 ESXi 4.1 update2 ESXi 5.0 ESXi 5.0 update1
VIOS	VIOS 2.2.0.12-FP-24SP02
Windows	2008 Hyper-V R2

Platform Updates	Updated Version
VMWare	VMWare ESX 3.5 Update 5 (3.5u5) (http://www.vmware.com/download/vi) VMWare ESX 4.0 (http://www.vmware.com/download/vi) VMWare ESXi 4.0 (http://www.vmware.com/download/vi) VMWare ESX 4.0 Update 3 (http://www.vmware.com/download/vi) VMWare ESXi 4.0 Update 3 (http://www.vmware.com/download/vi) VMWare ESX 4.1 (http://www.vmware.com/download/vi) VMWare ESX 4.1 Update1 (http://www.vmware.com/download/vi) VMWare ESXi 4.1 Update1 (http://www.vmware.com/download/vi) VMWare ESX 4.1 Update2 (http://www.vmware.com/download/vi) VMWare ESXi 4.1 Update2 (http://www.vmware.com/download/vi) VMWare ESXi 5.0 (http://www.vmware.com/download/vi) VMWare ESXi 5.0 Update1 (http://www.vmware.com/download/vi)
AIX / VIOS	Refer to Note 1 below
Windows	2008 Hyper-V R2 (http://www.microsoft.com/windowsserver2008/en/us/default.aspx)

Note 1: Refer to the Host System Attachment Guide for updated levels and additional information.

- <http://www.ibm.com/systems/support/supportsite.wss/docdisplay?Indocid=MIGR-5078491&brandind=5000020>

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Section 4 – Supported Software / Services

Microsoft Cluster Service (MSCS) Support	2 Node	4 Node	6 Node
Windows Server 2003 (32bit /64bit)	Supported	Supported	Supported
Windows Server 2008 R2 (64bit)	Supported	Supported	Supported

Note 1: Please refer to Chapter 6 in the Installation and User's Guide "Configuring blades for Microsoft Cluster Service".

- <http://www.ibm.com/systems/support/supportsite.wss/docdisplay?Indocid=MIGR-5078491&brandind=5000020>

Linux Clustering Support	Supported
RedHat Linux 5.2 / 5.3 / 5.4 / 5.7 / 5.8 / 6.1 / 6.2 / 6.3	Supported
SUSE Enterprise Server 10.2 / 10.3 / 10.4 / 11 / 11.1 / 11.2	Supported

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Section 5 – SAS RAID Module Firmware

SAS RAID Module Firmware	Version
SAS RAID Module Firmware Package	1.2.4.011
Detailed Firmware Levels Included within the Package 1. Software Version: H-2.1.3.4 2. Battery Backup Unit Firmware: 58.0 3. BMC Firmware: S0BT10A 4. Disk Storage Module Firmware: 1.08 5. SAS Switch Firmware: R1.07 6. FPGA: 1.07 7. SES Firmware: 01.07 8. Drive Firmware Levels a. Option 43W7523 (73GB): A496, BA2D, SA0A b. Option 43W7524 (146GB): A496, BA2D, BA4C, SA0A, BA4D c. Option 43X0802 (300GB): A496, BA2D, BA4C, A529, SA0A, BA4D d. Option 44W2234 (300GB): A3B8, BA58, A3C0, A3C2, BA5A e. Option 42D0519 (450GB): BA4C, BA4D f. Option 44W2239 (450GB): A3B8, BA58, A3C0, A3C2, BA5A g. Option 44W2244 (600GB): A3B8, BA58, A3C0, A3C2, BA5A h. Option 42D0546 (750GB): BC1H, BC2B, BC2C, BC45, BC1I i. Option 42D0547 (1TB): BC1H, BC1I j. Option 42D0777 (1TB): BC28, BC2B, BC2C, BC45 k. Option 42D0767 (2TB): BC28, BC2B, BC2C, BC45, J26C	

SAS RAID Module Firmware Update Utility – Supported Operating Systems		
	Storage Configuration Manager	Command Line
Microsoft Windows XP	Supported	Supported
Microsoft Windows Server 2003	Supported	Supported
Microsoft Windows Vista	Not Supported	Not Supported
Microsoft Windows 7	Not Supported	Supported
Microsoft Windows Server 2008	Supported	Supported
Red Hat Enterprise Linux 4 AS/ES	Supported	Supported
Red Hat Enterprise Linux 5 AS/ES	Supported	Supported
Red Hat Enterprise Linux 6 AS/ES	Supported	Supported
SUSE Linux Enterprise Server 9	Supported	Supported
SUSE Linux Enterprise Server 10	Supported	Supported
SUSE Linux Enterprise Server 11	Supported	Supported
VMWare	Supported	Supported
AIX / IBMi / VIOS	Not Supported	Supported

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Section 6 – Path Management

Windows – Path Management	Version	Comments
IBM Subsystem Device Driver Device Specific Module (SDDDSM)	2.4.3.3-2	Required for Windows
Windows Path Management Support Download URL (Installable Package) http://www.ibm.com/support/docview.wss?rs=540&context=ST52G7&dc=D430&uid=ssg1S4000350&loc=en_US&cs=utf-8&lang=en		

Linux - Path Management	Version	Comments
Red Hat Enterprise Linux 5.2/5.3/5.4 device-mapper-multipath	OS Default / Config File: 3.02	Required for Linux
Red Hat Enterprise Linux 5.7 device-mapper-multipath	OS Default / Config File: 3.05	Required for Linux
Red Hat Enterprise Linux 5.8 device-mapper-multipath	OS Default / Config File: 3.05	Required for Linux
Red Hat Enterprise Linux 6.1 device-mapper-multipath	OS Default / Config File: 3.06	Required for Linux
Red Hat Enterprise Linux 6.2 device-mapper-multipath	OS Default / Config File: default	
Red Hat Enterprise Linux 6.3 device-mapper-multipath	OS Default / Config File: default	
SUSE Linux Enterprise Server 10 device-mapper-multipath	OS Default / Config File: 3.03	Required for Linux
SUSE Linux Enterprise Server 11 device-mapper-multipath	OS Default / Config File: 3.04	Required for Linux
SUSE Linux Enterprise Server 11.2 device-mapper-multipath	OS Default / Config File: 3.07	Required for Linux
Linux Path Management Support Download URL (Configuration File) http://www.ibm.com/support/docview.wss?rs=540&context=ST52G7&dc=D430&uid=ssg1S4000107&loc=en_US&cs=utf-8&lang=en		

AIX - Path Management	Version	Comments
Native AIX PCM	OS Default	Required for AIX if SDDPCM is not installed.
AIX Subsystem Device Driver Path Control Module (SDDPCM)	2.6.2.1	SDDPCM is required if SAS connectivity card is installed; otherwise optional
AIX Subsystem Device Driver Path Control Module (SDDPCM) http://www.ibm.com/support/docview.wss?rs=540&context=ST52G7&dc=D430&uid=ssg1S4000201&loc=en_US&cs=utf-8&lang=en		

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Section 7 – SAS Expansion Card

SAS Expansion Card (CFFv) BIOS & FW	Minimum Version
SAS Expansion Card (CFFv) (39Y9190 / 8250) (DOS, Linux & Windows)	2.72
SAS Expansion Card (CFFv) (39Y9190 / 8250) (AIX)	00105000.1004912782 00105000.1004913005
SAS Connectivity Card (CIOv) (43W4068 / 8246) for HS22/23, HS23E, JS23, JS23/43, PS70x	Refer to Section 11
SAS Connectivity Card (CFFv) (43W3974 / NA) for HS21 XM, HS12, HS22	Refer to Section 11

Section 8 – Utilities & Management

Advanced Management Module	Recommended Version
BladeCenter Advanced Management Module (AMM)	BPET62R

Start Now Advisor Utility (SNA)	Minimum Version
Start Now Advisor – IBM BladeCenter	2.2

IBM Storage Configuration Manager (SCM)	Minimum Version
IBM Storage Configuration Manager	2.20.0

Section 9 – Ethernet Switch Modules

Ethernet Switch Firmware	Minimum Version
Nortel 1/10Gb Uplink Ethernet Switch Module (GbESM-1-10U)	1.0.1.0
Nortel Layer 2/3 GbE Switch Module (GbESM)	1.5.4.0
Nortel Layer 2-7 GbE Switch Module (GbESM)	21.0.12.0
Cisco Systems Catalyst Switch	12.2-46.SE
Server Connectivity Module	1.1.2.0
Nortel 10G Uplink Ethernet Switch Module	1.2.5.0
Intelligent Copper Pass-Thru Module	1.0.2.0

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Section 10 – SAS Device Drivers

SAS Device Drivers – Windows		Minimum Version
Microsoft Windows Server 2003 and 2008		1.31.02.00
Linux	RHEL5	4.22.80.04
	RHEL5.7	4.22.80.08
	RHEL5.8	4.22.80.08
	RHEL6.1	OS Default
	RHEL6.2	OS Default
	RHEL6.3	4.22.80.08
	SLES 10 / 10.2 / 10.3	4.22.80.04
	SLES 10.4	4.22.80.08
	SLES 11 / 11.1	4.22.80.06
	SLES 11.2	OS Default

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Section 11 – Blade Server Software & Drivers

HS12 Blade Server - Software and Drivers	Minimum Version
Flash BIOS (DOS, Linux & Windows)	1.11
Baseboard Management Controller (BMC) Firmware (DOS, Linux & Windows)	1.04
LSI 1064e SAS Controller BIOS and Firmware (DOS, Linux & Windows)	2.72

HS20 Blade Server - Software and Drivers	Minimum Version
Flash BIOS (DOS, Linux & Windows)	1.13
Baseboard Management Controller (BMC) Firmware (DOS, Linux & Windows)	1.34

HS21 Blade Server - Software and Drivers	Minimum Version
Flash BIOS (DOS, Linux & Windows)	1.20
Baseboard Management Controller (BMC) Firmware (DOS, Linux & Windows)	1.23
LSI 1064e SAS Controller BIOS and Firmware (DOS, Linux & Windows)	2.66

HS21 XM Blade Server - Software and Drivers	Minimum Version
Flash BIOS update v1.14 (DOS, Linux & Windows)	1.16
Baseboard Management Controller (BMC) Firmware (DOS, Linux & Windows)	1.34
LSI 1064e SAS Controller BIOS and Firmware (DOS, Linux & Windows)	2.72

HS22 Blade Server - Software and Drivers	Minimum Version
IBM Flash uEFI/BIOS (DOS, Linux & Windows)	1.10
LSI 1064e SAS Controller BIOS and Firmware (DOS, Linux & Windows)	2.71

HS22v Blade Server - Software and Drivers	Minimum Version
IBM Flash uEFI/BIOS (DOS, Linux & Windows)	1.10
LSI 1064e SAS Controller BIOS and Firmware (DOS, Linux & Windows)	2.72

HS23 Blade Server - Software and Drivers	Minimum Version
IBM Flash uEFI/BIOS (DOS, Linux & Windows)	tkE112O
LSI 2004 SAS Controller BIOS and Firmware (DOS, Linux & Windows)	1.10.08

HS23E Blade Server - Software and Drivers	Minimum Version
IBM Flash uEFI/BIOS (DOS, Linux & Windows)	1.00 (AHE112D)
LSI 2004 SAS Controller BIOS and Firmware (DOS, Linux & Windows)	1.10.06

LS20 Blade Server - Software and Drivers	Minimum Version
Flash BIOS (DOS, Linux & Windows)	1.30
Baseboard Management Controller (BMC) (DOS, Linux & Windows)	2.21

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LS21 & LS41 Blade Server - Software and Drivers	Minimum Version
Flash BIOS (DOS, Linux & Windows)	1.12
Baseboard Management Controller (BMC) Firmware (DOS, Linux & Windows)	1.32
LSI 1064 SAS Controller BIOS and Firmware (DOS, Linux & Windows)	2.72

LS22 & LS42 Blade Server - Software and Drivers	Minimum Version
Flash BIOS (DOS, Linux & Windows)	1.06
Baseboard Management Controller (BMC) Firmware (DOS, Linux & Windows)	1.06
LSI 1064e SAS Controller BIOS and Firmware (DOS, Linux & Windows)	2.72

JS12 Blade Server - Software and Drivers	Minimum Version
BIOS/Firmware Inband update (AIX & VIOS)	3.5.6 / 01EA350.103.074
SAS Expansion Card (CFFv) Firmware (AIX)	00105000.1004912782 00105000.1004913005

JS22 Blade Server - Software and Drivers	Minimum Version
BIOS/Firmware Inband (AIX & VIOS)	3.5.6 / 01EA350.103.074
SAS Expansion Card (CFFv) Firmware (AIX)	00105000.1004912782 00105000.1004913005

JS23 & JS43 Blade Server – Software and Drivers	Minimum Version
BIOS/Firmware Inband (AIX & VIOS)	3.5.6 / 01EA350.103.074
Integrated SAS Controller BIOS and Firmware (AIX & VIOS)	53495320.04200029

PS700, PS701 & PS702 Blade Server – Software and Drivers	Minimum Version
BIOS/Firmware Inband (AIX & VIOS)	7.1.6 / 01AA710_114_043
Integrated SAS Controller BIOS and Firmware (AIX & VIOS)	53495320.04200029

PS703 & PS704 Blade Server – Software and Drivers	Minimum Version
BIOS/Firmware Inband (AIX)	7.3.0 / 0AA730_029_029
Integrated SAS Controller BIOS and Firmware (AIX)	53495322.04220029

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