



IBM BladeCenter

The Right Choice – Open, Easy, Green

Interoperability Guide

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Document Purpose: Quick reference for BladeCenter Interoperability.

Compliment to ServerProven, COG, and the Configuration tools with

ServerProven being the most reliable, accurate, and up to date tool.

This paper is intended to provide information regarding BladeCenter Interoperability. It assembles data from other published IBM tools. Findings may not be realized in all customer environments, and implementation in such environments may require additional steps, configurations, and performance analysis. The information herein is provided "AS IS" with no warranties, express or implied. This information does not constitute a specification or form part of the warranty for any IBM, Intel, Brocade, Cisco, Emulex, McData, Myrinet, NetXen or QLogic products.

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Terminology

aMM Advanced Management Module

CFFh Combo Form Factor Horizontal I/O Expansion Card

CFFv Combo Form Factor Vertical I/O Expansion Card

CIOv Combinational (or Combo) IO Vertical expansion card

cMM Chassis Management Module

cMM2 Chassis Management Module II

EC I/O Expansion Card

HSEC High Speed I/O Expansion Card (Formally referred to as HSFF)

LFF HSEC Large Form Factor High Speed I/O Expansion Card

MSIM Multi Switch Interconnect Module

NEBS Network Equipment-Building System

BOFM BladeCenter Open Fabric Manager

OPM Optical Pass-Thru Module

SFF Small Form Factor

SFF EC Small Form Factor I/O Expansion Card

StFF Standard Form Factor (may require removal of Primary or secondary HDD)

Blade and Chassis

Blades & Management Modules to Chassis Interoperability

Table 1: Blades & Management Modules to Chassis Interoperability - Table 1

Blade Servers	S (8886, 1948)	T ¹ (DC 8720, AC8730)	H (8852, 7989)	HT ¹ (DC 8740, AC 8750)	aMM/ cMM2	MM
HX5 (7872, 7873)	Up to 130W ⁶	-	Up to 130W ⁵	Y ^{1,2}	Y	-
HS12 (8014, 8028)	Y	Y	Y	Y	Y	-
HS21 Quad Core (8853)	Y	Up to 50W ²	Y	Up to 120W ^{1,2}	Y	Y
HS21 XM Quad Core (7995)	Up to 80W	Up to 50W ²	Up to 80W	Up to 80W ²	Y	Y
HS22 (7870)	Y	-	Up to 130W ⁵	Up to 130W ^{1,2,4}	Y	-
HS22V (7871)	Y	-	Up to 130W ⁵	Up to 130W ^{1,2,4}	Y	-
HS23 (7875)	Y ⁷	-	Y ⁷	Y ⁷	Y	-
HS23E (8038)	Y	-	Y	Y	-	-
LS22 (7901)	Y	-	Y	Y	Y	-
LS42 (7902)	Y	-	Y	Y	Y	-
JS12 (7998-60x)	Y	Y	Y	Y	Y	-
JS22 (7998-61x)	Y	-	Y	Y ³	Y	-
JS23/43 (7778-23x)	Y	-	Y	Y	Y	-
PS700/701/702 (8406-70Y/71Y)	Y	-	Y	Y	Y	-
PS703/704 (7891-73X/74X)	Y	-	Y	Y	Y	-
QS21 (0792)	Y	-	Y	Y ¹	Y	-
QS22 (0793)	Y	-	Y	Y ¹	Y	-
Management Modules						
Management Module (MM)	-	-	-	-	N/A	N/A
Advanced Management Module (aMM)	Y	-	Y	Y	N/A	N/A
Advanced Management Module for Telco (also known as cMM2)	-	Y	-	-	N/A	N/A

W = CPU Power in watts, TDP watts

Notes:

1. Enterprise environment only (max 32°C). See 'Telco blades to Telco chassis Interoperability' table (next table) for NEBS statements.
2. May require power management policy to be set to "Redundant with Potential Performance Impact" in both domains to support higher-wattage CPUs.
3. Ten is the maximum number of JS22 blades supported in BCHT chassis
4. is the maximum number of 130W HS22 or HS22V supported in BCHT chassis
5. 130W is supported on HX5 (w/o MAX5), HS22 and HS22V with enhanced blowers. For HX5 with MAX5, 130W is supported up to six blades with 2900 power supply, and seven blades with 2980 power supply. Blades other than 130W HX5 can be inserted in a power domain if fewer than the maximum HX5 permissible are deployed. The exact quantity supported is based on power available as determined with the power configurator.

- Four is maximum number of HX5 130W supported in BCS. Blades other than 130W HX5 can be inserted in a power domain if fewer than the maximum HX5 permissible are deployed. The exact quantity supported is based on power available as determined with the power configurator.
- See section “HS23 Support Across BladeCenter H, S, HT and E Chassis” for limitations

Table 2: Blades & Management Modules to Chassis Interoperability - Table 2

Blade Servers	E (8677) 1200W/ 1400W Power Supplies	E (8677) 1800W Power Supplies	E (8677) 2000W Power Supplies	E (8677) 2320W Power Supplies	aMM	MM
HX5 (7872, 7873)	-	-	-	-	Y	-
HS12 (8014, 8028)	Y	Y	Y	Y	Y	-
HS21 Quad Core (8853)	Up to 80W	Up to 80W	Up to 80W	Up to 80W	Y	Y
HS21 XM Quad Core (7995)	Up to 80W ¹	Up to 80W ¹	Up to 80W ¹	Up to 80W ¹	Y	Y
HS22 (7870)	-	-	Up to 95W ²	Up to 95W	Y	-
HS22V (7871)	-	-	Up to 95W ²	Up to 95W	Y	-
HS23 (7875)	-	-	Y ⁵	Y ⁵	Y	-
HS23E (8038)	Y ⁶	Y ⁶	Y ⁶	Y ⁶	Y	-
LS22 (7901)	Up to 79W	Up to 79W	Up to 79W	Y	Y	-
LS42 (7902)	Up to 79W	Up to 79W	Up to 79W	Y	Y	-
JS12 (7998-60x)	Y	Y	Y	Y	Y	-
JS22 (7998-61x)	-	-	-	-	-	-
JS23/43 (7778-23x)	-	-	-	-	-	-
PS700	-	-	-	Y ³	Y ³	-
PS701/702/703/704	-	-	-	-	-	-
QS21 (0792)	-	-	-	-	-	-
QS22 (0793)	-	-	-	-	-	-
Management Modules						
Management Module (MM)	Y	Y	-	-	N/A	N/A
Advanced Management Module (aMM)	Y	Y	Y	Y	N/A	N/A
Advanced Management Module for Telco (also known as cMM2)	-	-	-	-	N/A	N/A

W = CPU Power in Watts, TDP watts

Notes:

- When fully configuring a BC-E (8677) chassis with the maximum possible HS21 XM blade server configuration (fourteen HS21 XM blade servers, each with two 80W processors, eight 4GB memory DIMMs, one SAS HDD, one USB-based flash drive, one I/O card and one cKVM card), there could be periods of time that Power Domain 2 exceeds the 13.5amp rating guidance (Power Domain 1 will not exceed the rating guidance). While this is not violating any safety rules, we recommend that your clients review the electrical infrastructure and power distribution of their installations to account for a peak of 14.4A
- HS22 and HS22V configurations supported in BC-E with 2000W power supplies
- PS700 is supported in the following BCE chassis:
 - 8677-4Sx
 - 8677-4Tx
 - 8677-3Sx with upgraded 2320W power supplies

- 8677-3Tx with upgraded 2320W power supplies
4. PS700 is NOT supported in the following BCE chassis:
 - 8677-3Xx
 - 8677-3Rx
 - 8677-E2x
 5. See section "HS23 Support Across BladeCenter H, S, HT and E Chassis" for limitations
 6. In BladeCenter E, not all Memory Option part numbers supported on HS23E are supported in all configurations. CPU throttling may occur within the BladeCenter E's ambient air temperature specification range if these limitations are not followed:
 - a. DIMMs:
 - i. IBM Option PN 46C0568, "8GB (1x8GB, 2Rx4, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz VLP DRIMM" with supplier part number MT36KDZS1G72PZ-1G4D1AD (no limitation on other supplier part numbers within IBM Option PN 46C0568).
 - ii. IBM Option PN 90Y3221, "16GB (1x16GB, 4Rx4, 1.35V) PC3L-8500 CL7 ECC DDR3 1066MHz VLP RDIMM" with supplier part number NVD2G7T3510FCD85I1HB0
 - b. Limitation:
 - * Not supported with two 95W processors and two DIMMs per channel in BladeCenter E. Supported with one 95W processor and two DIMMs per channel (up to 6 DIMMs attached to CPU1) or two 95W processors with one DIMM per channel (up to 3 DIMMs attached to CPU1 and 3 DIMMs attached to CPU2) with DIMM fillers removed in empty DIMM connectors of CPU2.

Table 3: BladeCenter E Support for HS22 and HS22V with the 2000W Power Supply

			Power domain 1						Power domain 2								
Power rating of HS22 or HS22V CPU	Max HS22 or HS22Vs installable	Total blades installable	Bay 1	Bay 2	Bay 3	Bay 4	Bay 5	Bay 6	Bay 7	Bay 8	Bay 9	Bay 10	Bay 11	Bay 12	Bay 13	Bay 14	Total bays that must remain empty
130 W	0	0	E	E	E	E	E	E	E	E	E	E	E	E	E	E	14
95 W	11	11						E							E	E	3
95 W	6	12													E	E	2
95 W	5	13						E									1
80 W	12	12						E								E	2
80 W	7	13														E	1
60 W	13	13														E	1
60 W	6	14															0
40 W	14	14															0

Notes:

1. A green square  in a bay means it can hold any blade server supported in the BladeCenter E *including* the HS22 and HS22V.
2. A blue square  in a bay means it can hold any blade server *except* an HS22 or HS22V.
3. An E in a square means that the bay must remain empty.
4. No support for 130W HS22 and HS22V on BladeCenter E

Table 4: HX5, HS22, and HS22V configurations supported in BC-H with 2900W Power Supplies

Blade	Power rating of HX5, HS22 or HS22V CPU	Max blades installable	Power domain 1							Power domain 2							Total bays that must remain empty
			Bay 1	Bay 2	Bay 3	Bay 4	Bay 5	Bay 6	Bay 7	Bay 8	Bay 9	Bay 10	Bay 11	Bay 12	Bay 13	Bay 14	
HS22 or HS22V	Up to 95W	14															0
	130W**	12							E							E	2
HX5	Up to 105W	14															0
	130W**	12							E							E	2
HX5 + MAX5	Up to 95W	7															0
	130W	6							E							E	2

Notes:

1. A green square  in a bay means blade supported
2. An E in a square means that the bay must remain empty. Bay Number for representation only – bay number not relevant (example: empty bay 1 can be substituted for empty bay 7). Total number of blades per domain cannot exceed 6 blades.
3. Enhanced blowers (PN 68Y6650) must be installed to support 130W HS22, 130W HS22V and 130W HX5 in BladeCenter H
4. Blades other than 130W HX5 can be inserted in a power domain if fewer than the maximum HX5 permissible are deployed. The exact quantity supported is based on power available as determined with the power configurator.

HX5, HS22, and HS22V Support Across BladeCenter H, S, HT and E Chassis

Table 5: HX5, HS22, and HS22V Support Across BladeCenter H, S, HT and E Chassis - Table 1

	BCH Models Other Than 4TX				BCH 4TX
	2900W		2980W (PN 68Y6601)		2980W
	Legacy blowers	Enhanced blowers PN: 68Y6650	Legacy blowers	Enhanced blowers	Enhanced blowers
HX5 (95W & 105W)	14	14	14	14	14
HX5 (130W)	No support	10	No support	12	12
HX5 + MAX5 (95W, 105W)	7	7	7	7	7
HX5 + MAX5 (130W)	6	6	7	7	7
HS22 & HS22V (up to 95W)	14	14	14	14	14
HS22 & HS22V (130W)	No support	12	No support	14	14

Note: Blades other than 130W HX5 can be inserted in a power domain if less than the maximum HX5 permissible are deployed. The exact quantity supported is based on power available as determined with the power configurator.

Table 6: HX5, HS22, and HS22V Support Across BladeCenter H, S, HT and E Chassis - Table 2

	BC-S	BladeCenter E	
		2000W	2320W
HX5 (95W & 105W)	5	No support	No support
HX5 (130W)	4	No support	No support
HX5 + MAX5 (95W, 105W)	2	No support	No support
HX5 + MAX5 (130W)	2	No support	No support
HS22 & HS22V (up to 95W)	6	See Note 2^	14
HS22 & HS22V (130W)	5	No support	No support

- Notes:**
1. HX5 not supported in BladeCenter E, BladeCenter HT NEBS and BladeCenter T
 2. Blades other than 130W HX5 can be inserted in a power domain if fewer than the maximum HX5 permissible are deployed. The exact quantity supported is based on power available as determined with the power configurator.
 3. Refer to "**Note 2** HS22 and HS22V configurations supported in BC-E with 2000W power supplies"

Table 7: HX5, HS22, and HS22V Support Across BladeCenter HT

	BC-HT (DC)		BC-HT (AC)	
	Enterprise	NEBS	Enterprise	NEBS
HX5 w/o MAX5 (95W & 105W)	10	No support	10	No support
HX5 w/o MAX5 (130W)	6	No support	8	No support
HX5 + MAX5 (95W, 105W)	5	No support	5	No support
HX5 + MAX5 (130W)	4	No support	5	No support
HS22 & HS22V (WSM-EP, up to 95W)	Up to 95W	Up to 80W CPU	Up to 95W	Up to 80W CPU
HS22 & HS22V (WSM-EP, 130W)	8	No support	10	No support

Note: This is only an estimate of the expected number of blades that can be supported. Please use the Power Configurator tool to determine the actual number of blades that can be populated based on the blade configuration.

HS23 Support Across BladeCenter H, S, HT and E Chassis

Table 8: HS23 Chassis Support

Description	BC-E (8677)	BC-T	BC-S (8886)	BC-H (8852)	BC-HT AC (8750)	BC-HT DC (8740)
HS23 with 115W to 135W ^{2,3} CPUs	-	-	Y	Limitations ¹	Limitations ¹	Limitations ¹
HS23 with up to 95W CPUs	Limitations ¹	-	Y	Limitations ¹	Limitations ¹	Limitations ¹

Notes:

1. See following table for limitation details
2. 130W CPUs E5-2680, E5-2643 and E5-2667 are supported in HS23
3. 135W CPU E5-2690 is supported with Thermal Limitations by SPORE only

Table 9: HS23 Chassis Support (Detailed)

CPU TDP (Thermal Design Power)	Maximum number of HS23 servers supported in each chassis ^{1,2}									
	BC-E with AMM ⁶ (8677) (14 bays)		BC-S (8886) (6 bays)	BC-H (models other than 4Tx) (14 bays)				BC-H (4Tx) (14 bays)	BC-HT AC (8750) (12 bays)	BC-HT DC (8740) (12 bays)
	2000 W power supplies	2320 W power supplies		2900W supplies		2980W supplies ³		2980W		
				Standard blowers	Enhanced blowers ⁴	Standard blowers	Enhanced blowers ⁴	Enhanced blowers ⁴		
Intel Xeon processors										
130W	-	-	6	-	14	-	14	14	-	-
115W	-	-	6	-	14	-	14	14	-	-
95W	-	-	6	-	14	-	14	14	-	-
80W	6+7	14	6	14	14	14	14	14	-	-
70W	-	-	6	-	14	-	14	14	-	-
60W	-	-	6	-	14	-	14	14	-	-
E5-2600 series Robust Thermal Profile Processors ⁵										
95W	5 + 7	14	6	14	14	14	14	14	12	12
70W	14	14	6	14	14	14	14	14	12	12

Notes:

1. A green cell means that the chassis can be filled with HS23 blade servers up to the maximum number of blade bays in the chassis (for example, 14 blades in the BladeCenter H).
2. A yellow cell means that the maximum number of HS23 blades that the chassis can hold is fewer than the total available blade bays (for example, 12 in a BladeCenter E). Other bays in the chassis must remain empty.
3. IBM BladeCenter H 2980W AC Power Modules, 68Y6601 (standard in 4Tx, optional with all other BC-H models)
4. IBM BladeCenter H Enhanced Cooling Modules, 68Y6650 (standard in 4Tx, optional with all other BC-H models).
5. Intel Xeon E5-2648L (70W) and E5-2658 (95W) are Robust Thermal Profile processors used in HS23
6. The HS23 is not supported in the BladeCenter E with power supplies smaller than 2000W.

HS23E Support Across BladeCenter H, S, HT and E Chassis

Table 10: HS23E Chassis Support (Detailed)

Table 10: H23E Chassis Support (Detailed)										
CPU TDP (Thermal Design Power)	Maximum number of HS23 servers supported in each chassis ^{1, 2}									
	BC-E with AMM ⁶ (8677) (14 bays)		BC-S (8886) (6 bays)	BC-H (models other than 4Tx) (14 bays)				BC-H (4Tx) (14 bays)	BC-HT AC (8750) (12 bays)	BC-HT DC (8740) (12 bays)
	2000 W power supplies	2320 W power supplies		2900W supplies		2980W supplies ³		2980W		
				Standard blowers	Enhanced blowers ⁴	Standard blowers	Enhanced blowers ⁴	Enhanced blowers ⁴		
Intel Xeon processors										
95W	5+6	6+8	6	14	14	14	14	14	12 ⁵	12 ⁵
80W	5+7	6+8	6	14	14	14	14	14	12 ⁵	12 ⁵
60W	6+8	6+8	6	14	14	14	14	14	12 ⁵	12 ⁵

Notes:

1. A green cell means that the chassis can be filled with HS23 blade servers up to the maximum number of blade bays in the chassis (for example, 14 blades in the BladeCenter H).
2. A yellow cell means that the maximum number of HS23 blades that the chassis can hold is fewer than the total available blade bays (for example, 12 in a BladeCenter E). Other bays in the chassis must remain empty.
3. IBM BladeCenter H 2980W AC Power Modules, 68Y6601 (standard in 4Tx, optional with all other BC-H models)
4. IBM BladeCenter H Enhanced Cooling Modules, 68Y6650 (standard in 4Tx, optional with all other BC-H models).
5. Support shown is for non-NEBS environments (upon completion of testing)
6. The HS23E is not supported in the BladeCenter E with power supplies smaller than 2000W.

BladeCenter HT Average Blade Power

Average per slot blade power is determined by AC or DC power chassis, power policy (user definable), and to a lesser extent, the power domain. The following table is for the BladeCenter HT, and assumes that all four power supplies are installed and all switch bays are occupied.

Table 11: BladeCenter HT Average Blade Power

	BLADE PWR			BLADE PWR		
	AC-W / Domain	AC-PD1	AC-PD2	DC-W / Domain	DC-PD1	DC-PD2
Power Module Redundancy	3160	404	410	2535	300	305
Power Module Redundancy with Blade Throttling Allowed	3420	447	454	3160	404	410
Basic Power Management	4000	544	550	3420	447	453

Blades to Expansion Units Interoperability

Table 12: Blades to Expansion Units Interoperability – Table 1

	Storage I/O	Memory and I/O Expansion Blade	Multi-Proc Unit	PCI Expansion Unit II	BC PCI Express I/O Expansion Unit	BC PCI Express Gen 2 Expansion Unit	BC PCI Express Gen 2 Expansion Blade II
Blade Servers	39R7563	42C1600	26K5934	25K8373	43W4391	46M6730	68Y7484
HX5 (7872, 7873)	-	-	-	-	-	Note 3	Note 3
HS12 (8014,8028)	Y	-	-	-	Note 2	-	-
HS21 Dual and Quad Core (8853)	Y	Y	-	Y	Y	-	-
HS21 XM Dual and Quad Core (7995)	Y	-	-	Y	Y	-	-
HS22 (7870)	-	-	-	-	Y	Y	Y
HS22V (7871)	-	-	-	-	Y	-	-
HS23 (7875)	-	-	-	-	-	-	Y
HS23E (8038)	-	-	-	-	-	Y	Y
LS22 (7901)	Y	-	-	Y	Y	-	-
LS42 (7902)	Y	-	-	Y	Y	-	-
JS12 (7998-60X)	-	-	-	-	-	-	-
JS22 (7998; except 60X)	-	-	-	-	-	-	-
JS23/43 (7778-23x)	-	-	-	-	-	-	-
PS700/701/702 (8406- 70Y/71Y)	-	-	-	-	-	-	-
PS703/704 (7891- 73X/74X)	-	-	-	-	-	-	-
QS21 (0792)	-	-	-	-	Y	-	-
QS22 (0793)	-	-	-	-	Y	-	-

Notes:

1. If you need support on the PCI Expansion Unit II (PEU2) for the LS21/41, contact your IBM Representative. IBM System x Sales representative, a SPORE is required to execute the LS21/41 on PEU2 solution.
2. Support only for machine type 8028
3. Support for three BPE4s on 2-socket HX5 and two BPE4s on 4-socket HX5

Table 13: Blades to Expansion Units Interoperability – Table 2

Blade Servers	BC GPU Expansion Blade FC5090 M2070 FC A10R M2070Q	BC GPU Expansion Blade w/M2075 46M6771	BC GPU Expansion Blade w/M2070Q 46M6772	BC GPU Expansion Blade (BGE) II with NVIDIA Tesla M2090 00D6881	BC GPU Expansion Blade (BGE) II with NVIDIA Tesla M2075 68Y7478	BC GPU Expansion Blade (BGE) II with NVIDIA Tesla M2070Q 68Y7479
HX5 (7872, 7873)	-	-	-	-	-	-
HS12 (8014,8028)	-	-	-	-	-	-
HS21 Dual and Quad Core (8853)	-	-	-	-	-	-
HS21 XM Dual and Quad Core (7995)	-	-	-	-	-	-
HS22 (7870)	Note 1	Y	Y	Y	Y	Y
HS22V (7871)	-	-	-	-	-	-
HS23 (7875)	-	-	-	Y	Y	Y
HS23E (8038)	-	Y	Y	Y	Y	Y
LS22 (7901)	-	-	-	-	-	-
LS42 (7902)	-	-	-	-	-	-
JS12 (7998-60X)	-	-	-	-	-	-
JS22 (7998; except 60X)	-	-	-	-	-	-
JS23/43 (7778-23x)	-	-	-	-	-	-
PS700/701/702 (8406- 70Y/71Y)	-	-	-	-	-	-

Notes:

- Support for up to 3 BladeCenter GPU Expansion Blades.. Support for 4 BladeCenter GPU Expansion Blades through special bids only.

Expansion Units Detail

Table 14: Expansion Units Details

Expansion Units	Max # CPUs	RAID Control	# HDD	Memory DIMM Slots	On Board NICS	Exp Slot 1	Exp Slot 2	Exp Slot 3
Storage and I/O Expansion Unit (39R7563)	0	Y	3	0	0	Y ¹	Y ²	Y ³
Memory and I/O Expansion Unit (42C1600)	0	-	0	4	2	Y ¹	Y ²	Y ³
Multi-proc Expansion Unit (26K5934)	2	-	1	8	2	Y ¹	Y ²	Y ³
PCI I/O Expansion Unit II (25K8373) ⁴	0	0	0	0	0	-	-	-
PCI I/O Expansion Unit II (25K8373) ⁴	0	0	0	0	0	-	-	-
PCI Express I PCI Express I/O Expansion Unit (43W4391) ⁴	0	0	0	0	0	-	-	-
PCI Express Gen 2 Expansion Unit (46M6730) ⁴	0	0	0	0	0	-	-	-
GPU Expansion Blade with nVidia Tesla M2075 (46M6771) ⁴	0	0	0	0	0	-	-	-
GPU Expansion Blade with nVidia Tesla M2070Q (46M6772) ⁴	0	0	0	0	0	-	-	-
PCI Express Gen 2 Expansion Unit II (68Y7484) ⁴	0	0	0	0	0	-	-	-
GPU Expansion Blade II with nVidia Tesla M2090 (00D6881) ⁴	0	0	0	0	0	-	-	-
GPU Expansion Blade II with nVidia Tesla M2075 (68Y7478) ⁴	0	0	0	0	0	-	-	-
GPU Expansion Blade II with nVidia Tesla M2070Q (68Y7479) ⁴	0	0	0	0	0	-	-	-

Notes:

1. Slot 1: Either StFF, SFF, or CFFv card can be used in slot. The card in Slot 1 must be an Ethernet card
2. Either StFF, SFF, or CFFv can be used in slot (when StFF or SFF is installed, CFFh cannot be adjacent slot)
3. HSEC or CFFh can be used in slot (when HSEC is installed, StFF or SFF cannot be adjacent slot)
4. HSEC or CFFh can not be used on a blade on which a PEU II or BPE3 is installed

The following PCI-x adapters can be used in slot 1 or 2 of the PCI I/O Expansion Unit II (25K8373)

02R0988	IBM ServeRAID-6M Ultra320 SCSI Controller (256MB Cache)
06P3601	IBM 10/100 Ethernet Server Adapter
13N2249	IBM Ultra320 SCSI Controller 2
24P0960	DS4000 Host Bus Adapter
22P6901	Wireless PCI
32P0033	IBM ServeRAID-6M Ultra320 SCSI Controller (128MB Cache)
39R8815	IBM ServeRAID-6M Ultra320 SCSI Controller (128MB Cache)
39R8816	IBM ServeRAID-6M Ultra320 SCSI Controller (256MB Cache)
39Y6079	NetXtreme 1000 T + Ethernet Adapter
39Y6088	NetXtreme 1000 SX + Fiber Ethernet Adapter
39Y6093	NetXtreme 1000 T + Dual Port Ethernet Adapter
73P4001	NetXtreme 1000 SX+ Ethernet Adapter-PCI-X
73P4101	NetXtreme 1000+ Server Adapter
73P4201	NetXtreme 1000+ Dual Port Server Adapter
90P3741	CMM Redundant Management Module for BladeCenter T

The following PCI-e adapters can be used in slot 1 or 2 of the PCI Express I/O Expansion Unit (43W4391)

39R6525	QLogic 4Gb FC Single-Port PCIe HBA for IBM System x
39R6527	QLogic 4Gb FC Dual-Port PCIe HBA for IBM System x
39Y6066	NetXtreme II 1000 Express Ethernet Adapter
39Y6136	PRO/1000 PT Quad Port Server Adapter by Intel
43W4324	IBM Ultra 320 SCSI Controller PCIe
43W4339	ServeRAID-MR10M SAS/SATA Controller

The following PCI-e adapters can be used in slot 1 or 2 of the PCI Express Gen 2 Expansion Blade (46M6730) or the PCI Express Gen 2 Expansion Blade II (68Y7484)

44X1940	QLogic Ethernet and 8Gb Fibre Channel Expansion Card (CFFh) for IBM BladeCenter
43W4423	InfiniBand 4X DDR Expansion Card (CFFh) for IBM BladeCenter
46M0878	IBM 320GB High IOPS SD Class SSD PCIe Adapter
42C1830	QLogic 2-port 10Gb Converged Network Adapter (CFFh) for IBM BladeCenter
46M6164	Broadcom 10Gb 4-port Ethernet Expansion Card (CFFh) for IBM BladeCenter
46M6168	Broadcom 10Gb 2-port Ethernet Expansion Card (CFFh) for IBM BladeCenter
49Y4235	Emulex Virtual Fabric Adapter (CFFh) for IBM BladeCenter

Blade Server to I/O Adapters/Modules Interoperability

Table 15: Blade Server to I/O Adapters/Modules Interoperability – Table 1

Option Part Number / Feature Code for x / Feature Code for p	I/O Expansion adapters/cards or connection devices (Form Factor)	HX5	HS12	HS21	HS21XM	HS22	HS22V	HS23	HS23E	LS22	LS42
	SAS										
43W3974	SAS Connectivity Card (CFFv)	-	Y ¹²	-	Y	-	-	-	-	-	-
39Y9190//8250	SAS Expansion Card (CFFv)	-	Y	Y	Y	-	-	-	-	Y	Y
43W4068	SAS Connectivity Card (CIOv)	Y ¹¹	-	-	-	Y ⁴	Y ⁴	Y ⁴	-	-	-
46C7167//8257	ServeRAID MR10ie (CIOv)	-	Y ²	-	-	Y ^{4, 5}	Y ^{4, 6}	-	-	-	-
46M6908	SSD Expansion Card for IBM BladeCenter HX5	Y	-	-	-	-	-	-	-	-	-
90Y4750	ServeRAID H1135 Controller for IBM Flex System and BladeCenter (CIOv)	-	-	-	-	-	-	-	Y	-	-
	InfiniBand										
32R1760	Cisco Systems 4X InfiniBand Expansion Card (HSFF) ¹	-	Y	Y	Y	-	-	-	-	Y	Y
43W4420//8298	Voltaire 4x InfiniBand DDR Expansion Card (CFFh) ¹	-	Y	Y	Y	Y	Y	-	-	Y	Y
43W4423//8258	4x InfiniBand DDR Expansion Card (CFFh) ¹	-	Y	Y	Y	Y	Y	-	-	Y	Y
46M6001//8272	2-port 40Gb InfiniBand Expansion Card (CFFh) ¹	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Notes:

- Only one CFFh/HS Option is allowed PER single-wide or multi-width Blade configuration, with the following exception. In the JS43 and PS702, and PS704, the CFFh/HS option may be stored in the top and/or bottom unit of the double-wide configuration.
- Supported only on machine type 8028
 - Attach to other disks not on the server blade (e.g. DSM, EXP 3000) requires the SAS Connectivity Card (43W3974) to be installed. Not supported for use with BladeCenter S SAS RAID Storage Module
- Cannot physically accommodate both the SRMR10ie (46C7167) and the SAS Connectivity Card (43W4068) as they both go in the same connector.
- Does not support the use of SATA or SSD drives
- Installation of optional battery-backed RAID adapter is for connection to external storage, not for internal SSD drives. Not supported for use with BladeCenter S SAS RAID Storage Module
- HX5 does not have an onboard LSI controller. SSD Expansion Card (LSI 1064E, FRU 46M6908) required for SSD or SAS Connectivity Card support
- 8028 model only

Table 16: Blade Server to I/O Adapters/Modules Interoperability – Table 2

Option Part Number / Feature Code for x / Feature Code for p	I/O Expansion adapters/cards or connection devices (Form Factor)	HX5	HS12	HS21	HS21XM	HS22	HS22V	HS23	HS23E	LS22	LS42
Ethernet											
39R8624	IBM SFF Gb Expansion Card (SFF)	-	Y	Y	Y	-	-	-	-	Y	Y
39Y9310 // 8249	Ethernet Expansion Card (CFFv)	-	Y	Y	Y	-	-	-	-	Y	Y
44W4465	4 port 10Gb card (CFFh) ¹	-	Y ³	Y ³	Y ³	Y ³	Y ³	-	-	Y ³	Y ³
44W4466	Broadcom 10Gb 2-port Ethernet Exp Card (CFFh) ¹	-	Y ³	Y ³	Y ³	Y ³	Y ³	-	-	Y ³	Y ³
44W4475// 8243	Ethernet Expansion Card (CIOv)	Y	-	-	-	Y	Y	Y	Y	-	-
44W4479//8291	2/4 Port Ethernet Expansion Card (CFFh) ²	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
46M6164//8293	Broadcom 10 Gb Gen 2 4-port Ethernet Expansion Card (CFFh)	Y	-	Y	Y	Y	Y	Y	Y	Y	Y
46M6168//8292	Broadcom 10 Gb Gen 2 2-port Ethernet Expansion Card (CFFh)	Y	-	Y	Y	Y	Y	Y	Y	Y	Y
81Y3133	Broadcom 2-port 10Gb Virtual Fabric Adapter for IBM BladeCenter	Y	-	-	-	Y	Y	Y	Y	-	-
49Y4235	Emulex Virtual Fabric Adapter (CFFh)	Y	-	-	-	Y	Y	-	Y	-	-
49Y4265	Emulex Virtual Fabric Advanced Upgrade for IBM BladeCenter	-	-	-	-	Y	Y	-	Y	-	-
49Y4275	Emulex Virtual Fabric Adapter Advanced (CFFh)	Y	-	-	-	Y	Y	-	Y	-	-
90Y3550	Emulex Virtual Fabric Adapter II (CFFh)	Y	-	-	-	Y	Y	-	Y	-	-
90Y3566	Emulex Virtual Fabric Adapter Advanced II (CFFh)	Y	-	-	-	Y	Y	-	Y	-	-
81Y3120	Emulex Virtual Fabric Adapter II for HS23	-	-	-	-	-	-	Y	-	-	-
90Y9332	Emulex Virtual Fabric Adapter Advanced II for HS23	-	-	-	-	-	-	Y	-	-	-
90Y3570	Mellanox 2-port Ethernet Expansion Card (CFFh)	Y	-	-	-	Y	Y	Y	-	-	-
42C1810	Intel 10 Gb 2-port Ethernet Expansion Card	-	-	-	-	Y	Y	Y	Y	-	-
10Gb/s Ethernet (Supporting Fibre Channel over Ethernet (FCoE))											
81Y1650	Brocade 2-port 10GbE Converged Network Adapter for IBM BladeCenter	Y	-	-	-	Y	Y	Y	Y	-	-
90Y3566	Emulex Virtual Fabric Adapter Advanced II (CFFh)	Y	-	-	-	Y	Y	-	Y	-	-
90Y9332	Emulex Virtual Fabric Adapter Advanced II for HS23	-	-	-	-	-	-	Y	-	-	-
42C1830 //8275	QLogic 2-port 10Gb Converged Network Adapter (CFFh)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Notes:

1. Supported only on BC-H and BC-HT
2. This 1Gb CFFh adapter drives HSSM bays 7,8,9,10
3. This card does not support MCAD/Auto Discovery with any combination of blade or switch

Table 17: Blade Server to I/O Adapters/Modules Interoperability – Table 3

Option Part Number / Feature Code for x / Feature Code for p	I/O Expansion adapters/cards or connection devices (Form Factor)	JS12	JS22	JS23	JS43	PS700	PS701	PS702	PS703	PS704	PN41	QS21	QS22
SAS													
43W3974	SAS Connectivity Card (CFFv)	-	-	-	-	-	-	-	-	-	-	-	-
39Y9190//8250	SAS Expansion Card (CFFv)	Y	Y	-	-	-	-	-	-	-	-	-	-
43W4068//8246	SAS Connectivity Card (CIOv)	-	-	Y ¹⁰	Y ¹⁰	Y ¹⁰	Y ¹⁰	Y ¹⁰	Y ¹⁰	Y ¹⁰	-	-	-
46C7167//8257	ServerRAID MR10ie (CIOv)	-	-	-	-	-	-	-	-	-	-	-	-
InfiniBand													
32R1760	Cisco Systems 4X InfiniBand Expansion Card (HSFF) ¹	Y	Y	-	-	-	-	-	-	-	-	Y	Y
43W4420//8298	Voltaire 4x InfiniBand DDR Expansion Card (CFFh) ¹	Y	Y	Y	Y	-	-	-	-	-	-	-	-
43W4423//8258	4x InfiniBand DDR Expansion Card (CFFh) ¹	Y	Y	Y	Y	Y	Y	Y	-	-	-	Y	Y
46M6001//8272	2-port 40Gb InfiniBand Expansion Card (CFFh) ¹	-	-	-	-	-	-	-	Y	Y	-	-	-
Ethernet													
39R8624	IBM SFF Gb Expansion Card (SFF)	-	-	-	-	-	-	-	-	-	-	-	-
39Y9310 // 8249	Ethernet Expansion Card (CFFv)	Y	Y	-	-	-	-	-	-	-	-	-	-
44W4465 ⁶	4 port 10Gb card (CFFh) ³	-	-	-	-	-	-	-	-	-	-	-	-
44W4466 ⁶	Broadcom 10Gb 2-port Ethernet Exp Card (CFFh) ³	-	-	-	-	-	-	-	-	-	-	-	-
44W4475// 8243	Ethernet Expansion Card (CIOv)	-	-	Y	Y	Y	Y	Y	Y	Y	-	-	-
44W4479 // 8291	2/4 Port Ethernet Expansion Card (CFFh) ⁷	Y	Y	Y	Y	Y	Y	Y	Y	Y	-	-	-
46M6164//8293	Broadcom 10 Gb Gen 2 4-port Ethernet Expansion Card (CFFh)	-	-	-	-	-	-	-	-	-	-	-	-
46M6168//8292	Broadcom 10 Gb Gen 2 2-port Ethernet Expansion Card (CFFh)	-	-	-	-	-	-	-	-	-	-	-	-
81Y3133	Broadcom 2-port 10Gb Virtual Fabric Adapter for IBM BladeCenter	-	-	-	-	-	-	-	-	-	-	-	-
49Y4235	Emulex Virtual Fabric Adapter (CFFh)	-	-	-	-	-	-	-	-	-	-	-	-
49Y4275	Emulex Virtual Fabric Adapter Advanced (CFFh)	-	-	-	-	-	-	-	-	-	-	-	-
90Y3550	Emulex Virtual Fabric Adapter II (CFFh)	-	-	-	-	-	-	-	-	-	-	-	-
90Y3566	Emulex Virtual Fabric Adapter Advanced II (CFFh)	-	-	-	-	-	-	-	-	-	-	-	-
42C1810	Intel 10 Gb 2-port Ethernet Expansion Card	-	-	-	-	-	-	-	-	-	-	-	-
10Gb/s Ethernet (Supporting Fibre Channel over Ethernet (FCoE))													
81Y1650	Brocade 2-port 10GbE Converged Network Adapter for IBM BladeCenter	-	-	-	-	-	-	-	-	-	-	-	-
39Y3566	Emulex Virtual Fabric Adapter Advanced II (CFFh)	-	-	-	-	-	-	-	-	-	-	-	-
42C1830 //8275	QLogic 2-port 10Gb Converged Network Adapter (CFFh)	Y ⁴	Y ⁴	Y ⁴	Y ⁴	Y ⁴	Y ⁴	Y ⁴	Y ⁴	Y ⁴	-	-	-

Notes:

1. Only one CFFh/HS Option is allowed PER single-wide or multi-width Blade configuration, with the following exception. In the JS43 and PS702, and PS704, the CFFh/HS option may be stored in the top and/or bottom unit of the double-wide configuration.
2. Supported only on BC-H and BC-HT
3. This 1Gb CFFh adapter drives HSSM bays 7,8,9,10
4. See FCoE Configuration Matrix for JS/PS Blades
5. For JS and PS blades using the SAS Connectivity Card, IBM BladeCenter S 6-Disk Storage Module (DSM), Options PN 43W3581 or FC#4545, must be installed in BCS Chassis to support SAS storage devices outside the chassis, including tape. No HDDs need to be installed in the DSM to support the external storage.
6. This card does not support MCAD/Auto Discovery with any combination of blade or switch

Table 18: Blade Server to I/O Adapters/Modules Interoperability – Table 4

Option Part Number / Feature Code for x / Feature Code for p	I/O Expansion adapters/cards or connection devices (Form Factor)	HX5	HS12	HS21	HS21XM	HS22	HS22V	HS23	HS23E	LS22	LS42
Fibre Channel											
26R0890	QLogic 4Gb SFF Fibre Channel Expansion Card (SFF) ³	-	-	Y	Y	-	-	-	-	-	-
39Y9186	Emulex 4Gb SFF Fibre Channel Expansion Card (SFF) ⁴	-	-	Y	Y	-	-	-	-	-	-
39Y9306 // 8252	QLogic Ethernet and 4Gb Fibre Channel Expansion Card (CFFh) ^{1,3}	-	Y	Y	Y	-	-	-	-	Y	Y
43W6859 // 8251	Emulex 4Gb Fibre Channel Expansion Card (CFFv) ⁴	-	Y	Y	Y	-	-	-	-	Y	Y
41Y8527 // 8248	QLogic 4Gb Fibre Channel Expansion Card (CFFv) ³	-	Y	Y	Y	-	-	-	-	Y	Y
44X1940//8271	QLogic Ethernet and 8 GB Fibre Channel Expansion Card (CFFh) ^{2,5}	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
44X1945 // 8242	Qlogic 8GB Fibre Channel Card (CIOv) ¹	Y ⁶	-	-	-	Y	Y	Y	Y	-	-
46M6065//8241	QLogic 4Gb Fibre Channel Expansion Card (CIOv) for IBM BladeCenter	Y	-	-	-	Y	Y	Y	Y	-	-
46M6140 //8240	Emulex 8Gb Fibre Channel Expansion Card (CIOv)	Y ⁶	-	-	-	Y	Y	Y	Y	-	-
Myrinet											
73P6000 // 8247	Myrinet Cluster Expansion Card (StFF)	-	-	Y	Y	-	-	-	-	Y	Y
iSCSI											
32R1923	QLogic iSCSI Expansion Card (StFF)	-	-	Y	Y	-	-	-	-	Y	Y
Other Blade Options											
38R4163	PCI NVRAM Blade Adapter	-	-	-	-	-	-	-	-	-	-
26K5939	cKVM Feature Card	-	Y	Y	Y	-	-	-	-	Y	Y

Notes:

1. Not supported on Brocade 10 port – 4Gb SAN Switch (32R1813) and Brocade 20 port – 4Gb SAN Switch (32R1812)
2. Only one CFFh/HS Option is allowed PER Blade. It must be installed on the top unit of the multi-width blade, with the following exception. In the JS43, PS702, PS704, the CFFh/HS option may be stored in the top and/or bottom unit of the double-wide configuration.
3. Internal switch connections to blade ports only supported at 2Gb FC in BC-T and BCH-T chassis with all switches except for 44X1905 / 3241 and 44X1907 / 3241 which support a max of 4Gb internal port speed in BC-HT only. External FC ports max speed is based on the individual switch capabilities.
4. Internal switch connections to blade ports only supported at 2Gb FC in BC-T and BCH-T chassis. External FC ports max speed is based on the individual switch capabilities.
5. Supported only in BCH with MSIM
6. Supported in 4Gb mode in all chassis slots or in 8Gb mode in BladeCenter chassis slots 6 and higher for HX5

Table 19: Blade Server to I/O Adapters/Modules Interoperability – Table 5

Option Part Number / Feature Code for x / Feature Code for p	I/O Expansion adapters/cards or connection devices (Form Factor)	JS12	JS22	JS23	JS43	PS700	PS701	PS702	PS703	PS704	PN41	QS21	QS22
	Fibre Channel												
26R0890	QLogic 4Gb SFF Fibre Channel Expansion Card (SFF) ⁴	-	-	-	-	-	-	-	-	-	-	-	-
39Y9186	Emulex 4Gb SFF Fibre Channel Expansion Card (SFF) ⁵	-	-	-	-	-	-	-	-	-	-	-	-
39Y9306 // 8252	QLogic Ethernet and 4Gb Fibre Channel Expansion Card (CFFh) ^{3,4}	Y	Y	Y	Y	Y	Y	Y	Y	Y	-	-	-
43W6859 // 8251	Emulex 4Gb Fibre Channel Expansion Card (CFFv) ⁵	Y	Y	-	-	-	-	-	-	-	-	-	-
41Y8527 // 8248	QLogic 4Gb Fibre Channel Expansion Card (CFFv) ⁴	Y	Y	-	-	-	-	-	-	-	-	-	-
44X1940//8271	QLogic Ethernet and 8 GB Fibre Channel Expansion Card (CFFh) ^{3,6}	Y ²	Y ²	Y ²	Y ²	Y ²	Y ²	Y ²	Y ²	Y ²	-	-	-
44X1945 // 8242	Qlogic 8GB Fibre Channel Card (CIOv) ¹	-	-	Y	Y	Y	Y	Y	Y	Y	-	-	-
46M6065//8241	QLogic 4Gb Fibre Channel Expansion Card (CIOv) for IBM BladeCenter	-	-	Y	Y	Y	Y	Y	Y	Y	-	-	-
46M6140 //8240	Emulex 8Gb Fibre Channel Expansion Card (CIOv)	-	-	Y	Y	Y	Y	Y	Y	Y	-	-	-
	Myrinet												
73P6000 // 8247	Myrinet Cluster Expansion Card (StFF)	-	-	-	-	-	-	-	-	-	-	-	-
	iSCSI												
32R1923	QLogic iSCSI Expansion Card (StFF)	Y	Y	-	-	-	-	-	-	-	-	-	-
	Other Blade Options												
38R4163	PCI NVRAM Blade Adapter	-	-	-	-	-	-	-	-	-	-	-	-
26K5939	cKVM Feature Card	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

1. Not supported on Brocade 10 port – 4Gb SAN Switch (32R1813) and Brocade 20 port – 4Gb SAN Switch (32R1812)
2. Ethernet support requires AIX V6.1 TL6 SP5, AIX V7.1 SP3, IBM i 6.1, IBM i 7.1, VIOS 2.2.0.12-FP24 SP02, or later levels.
3. Only one CFFh/HS Option is allowed PER Blade. It must be installed on the top unit of the multi-width blade, with the following exception. In the JS43, PS702, PS704, the CFFh/HS option may be stored in the top and/or bottom unit of the double-wide configuration.
4. Internal switch connections to blade ports only supported at 2Gb FC in BC-T and BCH-T chassis with all switches except for 44X1905 / 3241 and 44X1907 / 3241 which support a max of 4Gb internal port speed in BC-HT only. External FC ports max speed is based on the individual switch capabilities.
5. Internal switch connections to blade ports only supported at 2Gb FC in BC-T and BCH-T chassis. External FC ports max speed is based on the individual switch capabilities.

Blade Expansion Cards Form Factors

Table 20: Blade Expansion Card Form Factors

Blade Servers	CFFh	CFFv	CIOv	HSEC	SFF	StFF
HX5 (7872, 7873)	Y	-	Y	-	-	-
HS12 (8014,8028)	Y	Y	Y ²	-	Y	-
HS21 (8853)	Y	Y	-	Y	Y	Y
HS21 XM (7995)	Y	Y	-	Y	Y	Y
HS22 (7870)	Y	-	Y	-	-	-
HS22 V (7871)	Y	-	Y	-	-	-
HS23 (7875)	Y	-	Y	-	-	-
HS23E (8038)	Y	-	Y	-	-	-
LS22	Y	Y	-	Y	Y	Y
LS41 (7972)	Y	Y	-	Y	Y	Y
LS42 (	Y	Y	-	Y	Y	Y
JS12 (7998-60X)	Y	Y	-	Y	-	Y
JS22 (7998-61x)	Y	Y	-	Y	-	Y ¹
JS23/43 (7778-23x)	Y	-	Y	-	-	-
PS700/701/702 (8406-70Y/71Y)	Y	-	Y	-	-	-
PS703/704 (7891-73X/74X)	Y	-	Y	-	-	-
QS21 (0792)	Y	Y	-	Y	-	-
QS22 (0793)	Y	Y	-	Y	-	-

Notes;

1. JS12 and JS22 can physically accommodate the StFF form factor, but no StFF option cards will be tested and/or supported on it.
2. Only works with ServeRAID-MR10ie (46C7167)

Chassis to I/O Modules Interoperability

Table 21: Chassis to I/O Modules Interoperability – Table 1

Option Part Number/ Feature Code for x/ Feature Code for p	I/O Module	S ¹⁴ (8886)	E ⁵ (8677)	T ¹⁴ (DC 8720, AC 8730)	H ^{7, 10, 14} (8852, 7989)	HT ^{7, 10, 14} (8740, 8750)	MSIM ³	MSIM-HT ³	aMM/cMM2	MM
SAS										
39Y9195 //3267	SAS Connectivity Module	Y	Y ⁶	Y	Y	Y	-	-	Y	-
43W3584//3734	IBM BladeCenter S SAS RAID Controller Module ⁴	Y	-	-	-	-	-	-	Y	-
Ethernet										
32R1859 // 3211	IBM Layer 2-7 Gb Ethernet Switch	Y	Y	Y ¹³	Y	Y ¹³	-	-	Y	Y
32R1860 // 3212	IBM Layer 2/3 Copper Gb Ethernet Switch	Y ¹²	Y	Y ¹³	Y	Y ¹³	Y ¹	Y ¹	Y	Y
32R1861 // 3213	IBM Layer 2/3 Fiber Gb Ethernet Switch	Y ¹²	Y	Y ¹³	Y	Y ¹³	Y ¹	Y ¹	Y	Y
32R1888 // 3214	Cisco Systems Intelligent Gb Fiber Ethernet Switch	-	Y	Y ¹³	Y	Y ¹³	Y ¹	-	Y	-
32R1892	Cisco Systems Intelligent Gb Ethernet Switch	-	Y	Y ¹³	Y	Y ¹³	Y ¹	Y ¹	Y	-
39Y9267	IBM 6-port 10Gb Ethernet Switch Module	-	-	-	Y ⁸	Y ¹³	-	-	Y	-
39Y9324 //3220	Server Connectivity Module	Y	Y	Y ¹³	Y	Y ¹³	Y ¹	-	Y	Y
41Y8522 / 2988 / 3171 OR 00Y3250	Cisco Catalyst Switch Module 3110X	-	Y	Y ¹³	Y	Y ¹³	Y ¹	Y ¹	Y	-
41Y8523 / 2989 / 3173 OR 00Y3254	Cisco Catalyst Switch Module 3110G	-	Y	Y ¹³	Y	Y ¹³	Y ¹	Y ¹	Y	-
43W4395 / 5450 / 3174 OR 46C9272	Cisco Catalyst Switch Module 3012	Y ¹²	Y	Y ¹³	Y	Y ¹³	Y ¹	Y ¹	Y	-
44W4404 // 1590	IBM 1/10 Gb Uplink Ethernet Switch Module	Y ¹²	Y	Y ¹³	Y	Y ¹³	Y ¹	Y ¹	Y	-
10Gb/s Ethernet (Supporting Fibre Channel over Ethernet (FCoE))										
46C7191 //3248	IBM Virtual Fabric 10Gb Switch Module for IBM BladeCenter	-	-	-	Y	Y ¹³	-	-	Y	-
46M6071 // 2241 OR 46C9270	Cisco Nexus 4001I Switch Module	-	-	-	Y	Y ¹³	-	-	Y	-
46M6172 //3268	QLogic Virtual Fabric Extension Module	-	-	-	Y	-	-	-	Y ¹¹	-
46M6181 //5412	10Gb Ethernet Pass-Thru Module	-	-	-	Y	Y ¹³	-	-	Y	-
69Y1909	Brocade Converged 10GbE Switch Module for IBM BladeCenter	-	-	-	Y	Y	-	-	-	-
InfiniBand										
32R1756 // 3217	Cisco Systems 4X InfiniBand Switch Module	-	-	-	Y	-	-	-	Y	-
43W4419 //3216	4x InfiniBand Pass-Thru Module	-	-	-	Y	-	-	-	Y	-
46M6005 //3204	Voltaire 40Gb InfiniBand Switch Module	-	-	-	Y	-	-	-	Y	-

Notes:

1. Supported in left I/O Module bay of MSIM (39Y9314) with I/O cards QLogic Ethernet and 4 Gb Fibre Channel Expansion Card (CFFh, 39Y9306) and QLogic Ethernet and 8 GB Fibre Channel Expansion Card (CFFH, 44X1940). Supported in left and right I/O bay with 2/4 Port Ethernet Expansion Card (CFFh, 44W4479).
2. Supported in right I/O Module bay of MSIM (39Y9314) in BC-H or MSIM-HT = 44R5913 in BC-HT with I/O card QLogic Ethernet and 4 Gb Fibre Channel Expansion Card (CFFh, 39Y9306)
3. MSIM = 39Y9314. MSIM-HT = 44R5913
4. a: SAS RAID Controller Module minimum quantity of 1 is supported and must be installed in BladeCenter S I/O Bay3
b: SAS RAID Controller supports nearline SAS disk, which have features similar to SATA disks. The SAS RAID Controller Module does not support SATA disks
c: SAS RAID Controller should be used with the SAS Expansion Card (CFFv) for IBM BladeCenter (39Y9190), the SAS Connectivity Card (CFFv) for IBM BladeCenter (43W3974) or the SAS Connectivity Card (CIOv) for IBM BladeCenter (43W4068) as appropriate by blade type specified elsewhere in this document (current pages 14-15).
d: One Battery Backup Unit is shipped / packaged with each SAS RAID Controller
e: External storage or host attachment via the external SAS ports on the SAS RAID Controller is not supported.
f: Check the SAS RAID Module Interoperability Guide for Tape and hard drive support options.
5. BCE chassis came standard with the Management Module, not the Advanced Management Module (AMM).
6. When using BCE chassis with SAS Connectivity module (39Y9195), you must also have a AMM installed in the chassis.
7. 44W4479 is a four port 1GB Ethernet adapter. It requires the MSIM in the BC-H or MSIM-HT in the BC-HT and an ethernet switch in the left and right side of the MSIMs or up to 4 IBM Virtual Fabric 10Gb (46C7191) or Cisco Nexus 4001i (46M6071 or 46C9270) high-speed switch modules.
8. BC-H and BC-HT now supports four IBM 6-port 10Gb Ethernet Switches (39Y9267) when combined with Broadcom 4 port 10GB card (44W4465). 44W4465 does not support MCAD/Auto Discovery with any combination of blade or switch
9. Power supplies 3 and 4 are required when installing a switch module into Bays 5 through 10
10. Supports only aMM
11. Supported in BC-S chassis bay 1 or bay 2 with a CFFh Ethernet card
12. Switch is NEBS Level 3 compliant in respective chassis. Reports are available upon request.
13. Link Aggregation is not supported with the SOL ethernet port on JS and PS blades.

A Brocade SAN Switch Module for BladeCenter or any other Brocade switch or director utilizing the Fabric OS Access Gateway mode can connect to an INCITS T11 NPIV compliant device. The Brocade Access Gateway mode was designed to adhere to this standard. In addition, any INCITS T11 NPIV compliant device can connect to a Brocade switch or director that supports NPIV connectivity. Brocade does not test or make a discreet statement of support for any other vendor's devices. Brocade will assist IBM with problem determination for compliant configurations.

Table 22: Chassis I/O Modules Interoperability - Table 2

Option Part Number / Feature Code for x / Feature Code for p	I/O Module	S (8886)	E (8677)	T (DC 8720, AC 8730)	H 12 (8852, 7989)	HT12 (8740, 8750)	MSIM	MSIM-HT	aMM/cMM2	MM
	Fibre Channel									
32R1812 // 3206	Brocade 20 port – 4Gb SAN Switch	-	Y	Y ^{6, 15}	Y	Y ^{6, 15}	Y ^{2, 5}	-	Y	Y
32R1813 // 3207	Brocade 10 port – 4Gb SAN Switch	Y	Y	Y ^{6, 15}	Y	Y ^{6, 15}	Y ^{2, 5}	-	Y	Y
39Y9280 // 3242 OR 44E5696	Cisco Systems 4Gb 20 port Fibre Channel Switch Module	-	Y	Y ⁶	Y	Y ^{6, 15}	Y ^{2, 5}	Y ^{2, 5}	Y	Y
39Y9284 // 3241 OR 44E5692	Cisco Systems 4Gb 10 port Fibre Channel Switch Module	Y	Y	Y ⁶	Y	Y ^{6, 15}	Y ^{2, 5}	Y ^{2, 5}	Y	Y
43W6723 // 3245	4Gb Intelligent Pass-thru Module for IBM BladeCenter	Y	Y	Y ⁶	Y	Y ⁶	Y ^{2, 5}	-	Y	Y
43W6724 // 3243	QLogic 10 port – 4Gb SAN Switch Module	Y	Y	Y ^{6, 15}	Y	Y ^{6, 15}	Y ^{2, 5}	Y ^{2, 5}	Y	Y
43W6725 // 3244	QLogic 20 port – 4Gb SAN Switch Module	-	Y	Y ^{6, 15}	Y	Y ^{6, 15}	Y ^{2, 5}	Y ^{2, 5}	Y	Y
88Y6406 //	QLogic(R) 20-port 4/8 Gb SAN Switch Module7, 17	Y	Y	Y ⁸	Y	Y ^{9, 15}	Y ^{2, 5}	Y ^{2, 5}	Y	-
88Y6410 //	QLogic(R) 4/8 Gb Intelligent Pass-thru Module7, 17	Y	Y	Y ⁸	Y	Y ^{9, 15}	Y ^{2, 5}	-	Y	-
44X1905 // 3284	QLogic(R) 20-port 8 Gb SAN Switch Module7	Y	Y	Y ⁸	Y	Y ^{9, 15}	Y ^{2, 5}	Y ^{2, 5}	Y	-
44X1907 // 5449	QLogic(R)8 Gb Intelligent Pass-thru Module7	Y	Y	Y ⁸	Y	Y ^{9, 15}	Y ^{2, 5}	-	Y	-
42C1828	Brocade Enterprise 20port switch with software	-	Y ¹⁰	-	Y ¹⁰	Y ^{9, 10, 15}	Y ^{5, 11}	-	Y	-
44X1920//5869	Brocade 20-port 8Gb SAN Switch Module	-	Y ¹⁰	-	Y ¹⁰	Y ^{9, 10, 15}	Y ^{5, 11}	Y ^{2, 5}	Y	-
44X1921//5045	Brocade 10-port 8Gb SAN Switch Module	-	Y ¹⁰	-	Y ¹⁰	Y ^{9, 10, 15}	Y ^{5, 11}	Y ^{2, 5}	Y	-
	Other Modules									
39Y9314 // 3239	Multi-switch Interconnect Module (MSIM)	-	-	-	Y	--	-	-	Y	-
44R5913 //	Multi-switch Interconnect Module (MSIM-HT)	-	-	-	-	Y ¹⁵	-	-	Y	-
39Y9316 // 3218	Optical Pass-thru Module	Y	Y	Y ¹⁵	Y	Y ¹⁵	Y ⁴	-	Y	Y
39Y9320 // 3219	Copper Pass-thru Module 16	Y	Y ¹³	Y ¹⁵	Y	Y ¹⁵	Y ^{1, 14}	-	Y	Y
44W4483 //5452	Intelligent Copper Pass-thru Module	Y	Y	Y ¹⁵	Y	Y ¹⁵	Y ^{1, 14}	-	Y	-

Notes:

1. Supported in left I/O Module bay of MSIM (39Y9314) with I/O card QLogic Ethernet and 4 Gb Fibre Channel Expansion Card (CFFh, 39Y9306) and supported in left and right I/O module bay of MSIM (39Y9314) with I/O card 2/4 Port Ethernet Expansion Card (CFFh, 44W4479).
2. Supported in right I/O Module bay of MSIM and MSIM-HT with I/O card QLogic Ethernet and 4 Gb Fibre Channel Expansion Card (CFFh, 39Y9306)
3. Not supported or not applicable for use with MSIM (39Y9314) or MSIM-HT (44R5913)
4. OPM is supported in MSIM (39Y9314) for Ethernet in left or right I/O module bay with I/O card 2/4 Port Ethernet Expansion Card (CFFh, 44W4479) or Fibre Channel in right I/O module bay with I/O card QLogic Ethernet and 4 Gb Fibre Channel Expansion Card (CFFh, 39Y9306)
5. Supported in right I/O Module bay of MSIM and MSIM-HT with I/O card QLogic Ethernet and 8 Gb Fibre Channel Expansion Card (CFFh, 44X1940)
6. Internal switch connections to blade ports only supported at 2Gb FC. External ports support full 4Gb FC.
7. Not supported in combination with Cell blade (QS)
8. Internal switch connections to blade ports only supported at 2Gb FC. External ports support up to 8Gb FC.
9. Internal switch connections to blade ports supported at 2Gb or 4Gb maximum speed depending on the type of FC expansion card being used. See the Blade Server to I/O Adapters/Modules Interoperability Table in this document for more details. External ports support up to 8Gb FC.
10. Does not support Emulex 4Gb SFF Expansion card (39Y9186)
11. Supports only 8Gb CFFh expansion cards in MSIM and MSIM-HT
12. Power supplies 3 and 4 are required when installing a switch module into Bays 5 through 10
13. Must be paired with an additional switch or Intelligent Copper Pass-thru Module (44W4483) to flash HS22 firmware through the aMM
14. QLogic Ethernet and 8 GB Fibre Channel Expansion Card (44X1940, CFFH) supported in MSIM bays 7/9
15. Switch is NEBS Level 3 compliant in respective chassis. Reports are available upon request.
16. Not supported with PS70x blades
17. Qlogic 4/8 Gb SAN switch and PT internal speeds only auto-negotiate up to 4Gb in IO Module Bays 3 and 4.

Enhance I/O Redundancy on BladeCenter S

Table 23: Enhance I/O Redundancy on BladeCenter S for all blades except HS23 and HS23E

		Ethernet	Ethernet	Ethernet
		2 Ports	4 Ports	6 Ports
S	0	Base NIC on Blade	Base NIC + 2/4 port 1Gb CFFh (44W4479)	Base NIC + 2 port 1Gb CFFv (39Y9310) + 2/4 port 1Gb CFFh (44W4479)
S	2	Base NIC + SAS Expansion card (CFFv) (39Y9190 or 43W3974)	Base NIC + SAS Expansion card (CFFv) (39Y9190 or 43W3974) + 2/4 port 1Gb CFFh (44W4479)	

Table 24: Enhance I/O Redundancy on BladeCenter S for HS23

		Ethernet	Ethernet	Ethernet
		2 Ports	4 Ports	6 Ports
S	0	1GbE ports on base NIC (routed to switch bay 1)	1GbE ports on base NIC (routed to switch bay 1) + 10GbE ports on base NIC via 10Gb Interposer Card 94Y8550 (routed to switch bay 2, autonegotiating to 1Gb) OR 2/4 port 1Gb CFFh 44W4479 (routed to switch bay 2)	Either 4-port configuration + Ethernet Expansion Card (CIOv) 44W4475 (routed to switch bays 3 and 4)
S	2	1GbE ports on base NIC (routed to switch bay 1) + SAS Connectivity Card (CIOv) 43W4068 (routed to switch bays 3 and 4)	Either 4-port configuration + SAS Connectivity Card (CIOv) 43W4068 (routed to switch bays 3 and 4)	

Table 25: Enhance I/O Redundancy on BladeCenter S for HS23E

		Ethernet	Ethernet	Ethernet
		2 Ports	4 Ports	6 Ports
S	0	1GbE ports on base NIC (routed to switch bay 1)	1GbE ports on base NIC (routed to switch bay 1) + 2/4 port 1Gb CFFh 44W4479 (routed to switch bay 2)	1GbE ports on base NIC (routed to switch bay 1) + 2/4 port 1Gb CFFh 44W4479 (routed to switch bay 2) + Ethernet Expansion Card (CIOv) 44W4475 (routed to switch bays 3 and 4)
S	2	1GbE ports on base NIC (routed to switch bay 1) + ServeRAID H1135 Controller (CIOv) 90Y4750 (routed to switch bays 3 and 4)	1GbE ports on base NIC (routed to switch bay 1) + 2/4 port 1Gb CFFh 44W4479 (routed to switch bay 2) + ServeRAID H1135 Controller (CIOv) 90Y4750 (routed to switch bays 3 and 4)	

Enhance I/O Flexibility on BladeCenter H and BladeCenter HT

Table 26: Enhance I/O Flexibility on BladeCenter H and BladeCenter HT

		Ethernet; requires MSIM in High Speed Bays	Ethernet; requires MSIM or MSIM-HT in High Speed Bays	Ethernet; requires MSIM or MSIM-HT in High Speed Bays	Ethernet; requires MSIM or MSIM-HT in High Speed Bays
Fibre Channel		2 Ports	4 Ports	6 Ports	8 Ports
Fibre Channel	0	Base NIC on Blade	Base NIC + 2 port 1Gb CFFv (39Y9310)	Base NIC + 2/4 port 1Gb CFFh (44W4479) OR 4 port 10Gb CFFh (44W4465 ¹)	Base NIC + 2 port 1Gb CFFv (39Y9310) + 2/4 port 1Gb CFFh (44W4479) OR 4 port 10Gb CFFh (44W4465 ¹)
Fibre Channel	2	Base NIC + 2 port 4Gb FC card (CFFv) (41Y8527) OR 2 port 4Gb FC card (CFFv) (43W6859)	B Base NIC + 2 FC & 2 Ethernet Combo card (CFFh) (39Y9306 or 44X1940) OR Base NIC + 2 port 4Gb FC card (CFFv) (41Y5827 or 43W6859) + 2/4 port 1Gb CFFh (44W4479) or 2 port 10Gb CFFh (44W4466 ¹)	Base NIC + 2 port 4Gb FC card (CFFv) (41Y8527) or (43W6859) + 2/4 port 1Gb CFFh (44W4479) or 4 port 10Gb CFFh (44W4465 ¹)	N/A
Fibre Channel	4	Base NIC + 2 port 4Gb FC card (CFFv) (41Y8527 or 43W6859) + 2 FC & 2 Ethernet Combo card (CFFh) (39Y9306 or 44X1940)	Base NIC + 2 port 4Gb FC card (CFFv) (41Y8527 or 43W6859) + 2 FC & 2 Ethernet Combo card (CFFh) (39Y9306 or 44X1940)	N/A	N/A

Notes:

1. This card does not support MCAD/Auto Discovery with any combination of blade or switch

Switch to Card Interoperability

Table 27: Switch to Card Interoperability – Table 1

Option Part Number	I/O Module	32R1923 QLogic iSCSI Expansion Card (StFF)	39R8624 SFF Gb Expansion Card (SFF)	39Y9310 Ethernet Expansion Card (CFFv)	44W4475 Ethernet Expansion Card (CIOv)	44W4479 2/4 Port Ethernet Expansion Card (CFFh)	94Y8550 10Gb Interposer Card for IBM BladeCenter HS23 ³
1Gb Ethernet							
32R1859	IBM Layer 2-7 Gb Ethernet Switch	-	-	Y	Y	Y ²	--
32R1860	IBM Layer 2/3 Copper Gb Ethernet Switch	-	-	Y	Y	Y ¹	--
32R1861	IBM Layer 2/3 Fiber Gb Ethernet Switch	-	-	Y	Y	Y ¹	--
32R1888	Cisco Systems Intelligent Gb Fiber Ethernet Switch	Y	Y	Y	Y	Y ¹	--
32R1892	Cisco Systems Intelligent Gb Ethernet Switch	Y	Y	Y	Y	Y ¹	--
39Y9324	Server Connectivity Module	-	-	Y	Y	Y ¹	Y ¹
41Y8522/ 00Y3250	Cisco Catalyst Switch Module 3110X	Y	Y	Y	Y	Y ¹	--
41Y8523/ 00Y3254	Cisco Catalyst Switch Module 3110G	Y	Y	Y	Y	Y ¹	--
43W4395/ 46C9272	Cisco Catalyst Switch Module 3012	Y	Y	Y	Y	Y ¹	Y ¹
44W4404	IBM 1/10 Gb Uplink Ethernet Switch Module	-	-	Y	Y	Y ¹	Y ¹
44W4483	Intelligent Copper Pass-thru Module	Y	Y	Y	Y	Y ¹	Y ¹

Notes:

1. Requires MSIM in BC-H or MSIM-T in BC-HT
2. Supports only BC-S
3. No support for 10Gb Interposer Card for IBM BladeCenter HS23 (94Y8550) in BladeCenter E

Table 28: Switch to Card Interoperability - Table 2

Option Part Number	I/O Module	81Y1650 Brocade 2-port 10GbE Converged Network Adapter	42C1830 QLogic 2-port 10Gb Converged Network Adapter (CFFh)	44W4465 Broadcom 4 port 10Gb Card (CFFh)	44W4466 Broadcom 10Gb 2-port Ethernet Exp Card (CFFh)	46M6164 Broadcom 10Gb Gen 2 4-port Ethernet Expansion Card (CFFh)	46M6168 Broadcom 10Gb Gen 2 2-port Ethernet Expansion Card (CFFh)	81Y3133 Broadcom 2-port 10Gb Virtual Fabric Adapter	49Y4235 Emulex Virtual Fabric Adapter (CFFh)	49Y4275 Emulex Virtual Fabric Adapter Advanced (CFFh)	90Y3550 Emulex Virtual Fabric Adapter II (CFFh)	90Y3566 Emulex Virtual Fabric Adapter Advanced II (CFFh)	81Y3120 Emulex 10GbE VFA II for IBM BladeCenter HS23	90Y9332 Emulex 10GbE VFA Advanced II for IBM BladeCenter HS23	HS23 Integrated 10Gb Virtual Fabric LOM	42C1810 Intel 10Gb 2-port Ethernet Expansion Card (CFFh)	90Y3570 Mellanox 2-port Ethernet Expansion Card
10Gb Ethernet																	
39Y9267	IBM 10G Ethernet Switch Module for IBM BladeCenter	-	-	Y ²	Y ²	Y	Y	-	Y	-	-	-	-	-	-	Y ¹	-
46C7191	IBM Virtual Fabric 10Gb Switch Module for IBM BladeCenter	-	Y	Y ²	Y ²	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y ³	-	Y
46M6071/ 46C9270	Cisco Nexus 4001I Switch Module	-	Y	-	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y ³	Y ¹	Y
46M6181	10Gb Ethernet Pass-Thru Module	-	Y	-	-	-	-	-	Y	Y	Y	Y	Y	Y	Y ³	-	-

Notes:

1. Force switch port to 10Gb fixed, WoL not supported
2. This card does not support MCAD/Auto Discovery with any combination of blade or switch
3. HS23 Integrated 10Gb Virtual Fabric LOM requires use of the 10Gb Interposer Card (94Y8550), the Emulex 10GbE VFA II for IBM BladeCenter HS23 (81Y3120), or the Emulex 10GbE VFA Advanced II for IBM BladeCenter HS23 (90Y9332) to connect the integrated 10GbE ports to switch bays 7 and 9.

Table 29: Switch to Card Interoperability - Table 3

Option Part Number	I/O Module	81Y1650 Brocade 2-port 10GbE Converged Network Adapter	42C1830 QLogic 2-port 10Gb Converged Network Adapter (CFFh)
	10Gb/s Ethernet (Supporting Fibre Channel over Ethernet (FCoE))		
46C7191	IBM Virtual Fabric 10Gb Switch Module for IBM BladeCenter	-	Y ²
46M6181	10Gb Ethernet Pass-Thru Module	-	Y ²
49Y9983	Cisco Nexus 4001I Switch Module	-	Y ²
46M6172	QLogic Virtual Fabric Extension Module	-	Y ^{1,3}
69Y1909	Brocade Converged 10GbE Switch Module for IBM BladeCenter	Y	Y ²

Notes:

1. Requires IBM Virtual Fabric 10Gb switch module for IBM BladeCenter (46C7191)
2. See FCoE Configuration Matrix for JS/PS Blades
3. Supports FCoE via software upgrade

Table 30: Switch to Card Interoperability - Table 4

Option Part Number	I/O Module	49Y4235 Emulex Virtual Fabric Adapter (CFFh)	49Y4275 Emulex Virtual Fabric Adapter Advanced (CFFh)	90Y3550 Emulex Virtual Fabric Adapter II (CFFh)	90Y3566 Emulex Virtual Fabric Adapter Advanced II (CFFh)	81Y3120 Emulex 10GbE VFA II for IBM BladeCenter HS23	90Y9332 Emulex 10GbE VFA Advanced II for IBM BladeCenter HS23	HS23 Integrated 10Gb Virtual Fabric LOM
	10Gb/s FCoE and pNIC							
46C7191	IBM Virtual Fabric 10Gb Switch Module for IBM BladeCenter	Y ²	Y	Y ²	Y	Y ²	Y	Y ²
49Y9983	Cisco Nexus 4001I Switch Module	Y ²	Y	Y ²	Y	Y ²	Y	Y ²
69Y1909	Brocade Converged 10GbE Switch Module for IBM BladeCenter	Y ²	Y	Y ²	Y	Y ²	Y	Y ²
46M6172	QLogic Virtual Fabric Extension Module	Y ^{1,2}	Y ¹	Y ^{1,2}	Y ¹	Y ^{1,2}	Y ¹	Y ^{1,2}

Notes:

1. Requires IBM Virtual Fabric 10Gb switch module for IBM BladeCenter (46C7191)
2. Supports FCoE via software upgrade

Table 31: Switch to Card Interoperability - Table 5

Option Part Number	I/O Module	49Y4235 Emulex Virtual Fabric Adapter (CFFh)	49Y4275 Emulex Virtual Fabric Adapter Advanced (CFFh)	90Y3550 Emulex Virtual Fabric Adapter II (CFFh)	90Y3566 Emulex Virtual Fabric Adapter Advanced II (CFFh)	81Y3120 Emulex 10GbE VFA II for IBM BladeCenter HS23	90Y9332 Emulex 10GbE VFA Advanced II for IBM	HS23 Integrated 10Gb Virtual Fabric LOM
10Gb/s Ethernet with VFA								
46C7191	IBM Virtual Fabric 10Gb Switch Module for IBM BladeCenter	Y	Y	Y	Y	Y	Y	Y

Table 32: Switch to Card Interoperability - Table 6

Option Part Number	I/O Module	81Y3133 Broadcom 2-port 10Gb Virtual Fabric Adapter	90Y3550 Emulex Virtual Fabric Adapter II	90Y3566 Emulex Virtual Fabric Adapter Advanced II	81Y3120 Emulex 10GbE VFA II for IBM BladeCenter HS23	90Y9332 Emulex 10GbE VFA Advanced II for IBM BladeCenter HS23	HS23 Integrated 10Gb Virtual Fabric LOM
10Gb/s Ethernet with VFA Switch Independent Mode							
46M6071/ 46C9270	Cisco Nexus 4001I Switch Module	Y	Y	Y	Y	Y	Y
69Y1909	Brocade Converged 10GbE Switch Module for IBM BladeCenter	Y	Y	Y	Y	Y	Y
46M6181	10Gb Ethernet Pass-Thru Module	-	Y	Y	Y	Y	Y

Table 33: Switch to Card Interoperability - Table 7

Option Part Number	I/O Module	4GB	26R0890 QLogic 4Gb SFF Fibre Channel Expansion Card (SFF)	39Y9186 Emulex 4Gb SFF Fibre Channel Expansion Card (SFF)	39Y9306 QLogic Ethernet and 4Gb Fibre Channel Expansion Card (CFFh)	43W6859 Emulex 4Gb Fibre Channel Expansion Card (CFFv)	41Y8527 QLogic 4Gb Fibre Channel Expansion Card (CFFv)	46M6065 QLogic 4Gb Fibre Channel Expansion Card (CIOv)	8GB	44X1940 QLogic Ethernet and 8 GB Fibre Channel Expansion Card (CFFH)	44X1945 Qlogic 8GB Fibre Channel Card (CIOv)	46M6140 Emulex 8Gb Fibre Channel Expansion Card (CIOv)
	Fibre Channel											
4GB												
32R1812	Brocade 20 port – 4Gb SAN Switch		Y	Y	Y	Y	Y	Y		Y	-	-
32R1813	Brocade 10 port – 4Gb SAN Switch		Y	Y	Y	Y	Y	Y		Y	-	-
39Y9280/44E5696	Cisco Systems 4Gb 20 port Fibre Channel Switch Module		Y	Y	Y	Y	Y	Y		Y	Y	Y
39Y9284/44E5692	Cisco Systems 4Gb 10 port Fibre Channel Switch Module		Y	Y	Y	Y	Y	Y		Y	Y	Y
43W6723	4Gb Intelligent Pass-thru Module for IBM BladeCenter		Y	Y	Y	Y	Y	Y		Y	Y	Y
43W6724	QLogic 10 port – 4Gb SAN Switch Module		Y	Y	Y	Y	Y	Y		Y	Y	Y
43W6725	QLogic 20 port – 4Gb SAN Switch Module		Y	Y	Y	Y	Y	Y		Y	Y	Y
8GB												
88Y6406	QLogic 20-port 4/8Gb SAN Switch Module		Y	Y	Y	Y	Y	Y		Y	Y	Y
88Y6410	QLogic 4/8Gb Intelligent Pass-thru Module		Y	Y	Y	Y	Y	Y		Y	Y	Y
44X1905	QLogic 20-port 8Gb SAN Switch Module		Y	Y	Y	Y	Y	Y		Y	Y ¹	Y
44X1907	QLogic 8Gb Intelligent Pass-thru Module		Y	Y	Y	Y	Y	Y		Y	Y ¹	Y
42C1828	Brocade Enterprise 20port switch with software		Y	-	Y	Y	Y	Y		Y	Y	Y
44X1920	Brocade 20-port 8Gb SAN Switch Module		Y	-	Y	Y	Y	Y		Y	Y	Y
44X1921	Brocade 10-port 8Gb SAN Switch Module		Y	-	Y	Y	Y	Y		Y	Y	Y

Notes:

- To operate FC# 8242 (44X1945) at 8Gb speed with FC# 3284 (44X1905) or FC# 5449 (44X1907) requires updating the factory settings to the minimum configuration requirements defined in public Retain TIP H202210. Refer to the Retain TIP H202210 for specific configuration requirements for the switch module type used.

Table 34: Switch to Card Interoperability - Table 8

Option Part Number	I/O Module	32R1760 Cisco Systems 4X InfiniBand Expansion Card (HSFF)	43W4420 Voltaire 4x InfiniBand DDR Expansion Card (CFFh)	43W4423 4x InfiniBand DDR Expansion Card (CFFh)	46M6001 2-port 40Gb InfiniBand Expansion Card (CFFh)
	InfiniBand				
32R1756	Cisco Systems 4X InfiniBand Switch Module	Y	-	-	-
43W4419	4x InfiniBand Pass-Thru Module	-	Y	Y	-
46M6005	Voltaire 40Gb InfiniBand Switch Module	-	Y	Y	Y

Table 35: Switch to Card Interoperability - Table 9

Option Part Number	I/O Module	39Y9190 SAS Expansion Card for IBM BladeCenter (CFFv)s	43W3974 SAS Connectivity Card (CFFv)	43W4068 SAS Connectivity Card (CIOv)	46C7167 ServeRAID MR10ie (CIOv)	90Y4750 ServeRAID H1135 Controller (CIOv)
	SAS					
39Y9195	IBM BladeCenter SAS Connectivity Module	Y	Y	Y	Y	Y
43W3584	SAS RAID Controller Module for BladeCenter S Chassis	Y	Y	Y	-	Y

iSCSI Configuration Matrix for IBM BladeCenter

Note: Not all Server, HBA, OS, SAN and Storage combinations are supported. Specific end to end iSCSI configuration support must be verified through SSIC.

<http://www-03.ibm.com/systems/support/storage/ssic/interoperability.wss>

Table 36: iSCSI Configuration Matrix for IBM BladeCenter

Blade Converged Network Adapter (IBM PN)	BladeCenter Switch Module	FCoCEE Transit Switch	Supported OS	Supported IBM FC Storage
Choose From: 1) Emulex VFA II with Upgrade (PN 90Y3550 + 49Y4265) 2) Emulex VFA Advanced II (PN 90Y3566) 3) Emulex 10GbE VFA II for HS23 with Upgrade (PN 81Y3120 + 90Y9350) ¹⁰ 4) Emulex 10GbE VFA Advanced II for HS23 (PN 90Y9332) ¹⁰ 5) HS23 Integrated 10Gb VF LOM	Supported in pNIC Mode			
	IBM BladeCenter Virtual Fabric 10Gb Switch Module (46C7191)	Not Required	RHEL 6.2 SLES 10 SP4 ESX 4.1 u2	SVC V7K FC, SVC V7K FCoE, DS3K, DS5K, DS8K, XIV
	IBM BladeCenter Virtual Fabric 10Gb Switch Module (46C7191)	G8124E	RHEL 6.2 SLES 10 SP4 ESX 4.1 u2	SVC V7K FC, SVC V7K FCoE, DS3K, DS5K, DS8K, XIV
	Supported in IBM Virtual Fabric Mode & Switch Independent Mode			
	IBM BladeCenter Virtual Fabric 10Gb Switch Module (46C7191)	Not Required	RHEL 6.2 SLES 10 SP4 ESX 4.1 u2	SVC V7K FC, SVC V7K FCoE, DS3K, DS5K, DS8K, XIV
	IBM BladeCenter Virtual Fabric 10Gb Switch Module (46C7191)	G8124E	RHEL 6.2 SLES 10 SP4 ESX 4.1 u2	SVC V7K FC, SVC V7K FCoE, DS3K, DS5K, DS8K, XIV

FCoE Configuration Matrix for IBM BladeCenter

Note: Not all Server, HBA, OS, SAN and Storage combinations are supported. Specific end to end FCoE configuration support must be verified through SSIC.

<http://www-03.ibm.com/systems/support/storage/ssic/interoperability.wss>

Table 37: FCoE Configuration Matrix for IBM BladeCenter

Blade Converged Network Adapter (IBM PN, Vendor PN)	BladeCenter Switch Module	FCoE Top of Rack Switch	Supported SAN Fabric	Supported OS	Supported IBM FC Storage
QLogic CNA (42C1830)	10Gb Ethernet Pass-Thru Module (46M6181)	IBM Converged Switch B32 (Brocade 8000) ¹	Brocade	Win 2K8 RHEL 5/6 SLES 10/11 ESX 4.1 vSphere 5.0	DS3K DS5K DS8K V7K SVC XIV Tape
QLogic CNA (42C1830)	10Gb Ethernet Pass-Thru Module (46M6181)	Cisco Nexus 5010/5020 ²	Cisco	Win 2K8 RHEL 5/6 SLES 10/11 ESX 4.1	DS3K DS5K DS8K V7K SVC XIV Tape
QLogic CNA (42C1830)	Cisco® Nexus 4001l Switch Module (46M6071 or 46C9270)	Cisco Nexus 5010/5020 ²	Cisco	Win 2K8 RHEL 5/6 SLES 10/11 ESX 4.1	DS3K DS5K DS8K V7K SVC XIV Tape
QLogic CNA (42C1830)	IBM BladeCenter Virtual Fabric 10Gb Switch Module (46C7191) + QLogic Virtual Fabric Extension Module (46M6172)	Not Required	Brocade ³ & Cisco ³	Win 2K8 RHEL 5/6 SLES 10/11 ESX 4.1 vSphere 5.0	DS3K DS5K DS8K V7K SVC XIV Tape
QLogic CNA (42C1830)	Brocade Converged 10GbE Switch (69Y1909)	Not Required	Brocade	Win 2K8 RHEL 5/6 SLES 10/11 ESX 4.1	DS3K DS5K DS8K V7K SVC XIV Tape

Notes:

1. For full interoperability for IBM Converged Switch B32 (Brocade 8000), go to <http://www.ibm.com/systems/storage/san/b-type/library.html>
2. For full interoperability for Cisco Nexus Switch for IBM System go to <http://www.ibm.com/systems/networking/switches/san/ctype/nexus/index.html>
3. Must be through Intelligent Pass Through Mode through QLogic Virtual Fabric Extension Module

Table 38: Emulex FCoE pNIC Configuration Matrix for IBM BladeCenter

Blade Converged Network Adapter (IBM PN)	BladeCenter Switch Module	FCoE Top of Rack Switch	Supported SAN Fabric	Supported OS	Supported IBM FC Storage
Supported in pNIC Mode					
Choose From: 1) Emulex VFA II with Upgrade (PN 90Y3550 + 49Y4265) 2) Emulex VFA Advanced II (PN 90Y3566) 3) Emulex 10GbE VFA II for HS23 with Upgrade (PN 81Y3120 + 90Y9350) ¹⁰ 4) Emulex 10GbE VFA Advanced II for HS23 (PN 90Y9332) ¹⁰ 5) HS23 Integrated 10Gb VF LOM	IBM BladeCenter Virtual Fabric 10Gb Switch Module (46C7191) + QLogic Virtual Fabric Extension Module (46M6172)	Not Required	Not Required ⁷	Win 2K8 RHEL 5.6 SLES 11 SP1 ESX 4.1 vSphere 5.0	DS3K DS5K
	IBM BladeCenter Virtual Fabric 10Gb Switch Module (46C7191) + QLogic Virtual Fabric Extension Module (46M6172)	Not Required	Brocade ³	Win 2K8 RHEL 5.6 SLES 11 SP1 ESX 4.1 vSphere 5.0	DS3K DS5K
	IBM BladeCenter Virtual Fabric 10Gb Switch Module (46C7191) + QLogic Virtual Fabric Extension Module (46M6172)	Not Required	Cisco ³	Win 2K8 RHEL 5.6 SLES 11 SP1 ESX 4.1 vSphere 5.0	DS3K DS5K
	IBM BladeCenter Virtual Fabric 10Gb Switch Module (46C7191)	Cisco Nexus 5010/5020 ²	Cisco	Win 2K8 RHEL 5.6 SLES 11 SP1 ESX 4.1	V7K, DS3K ⁸ , DS5K ⁸
	Brocade Converged 10GbE Switch (69Y1909)	Not Required	Not Required ⁶	Win 2K8 RHEL 5.6 SLES 11 SP1 ESX 4.1	DS3K DS5K
	Brocade Converged 10GbE Switch (69Y1909)	Not Required	Not Required ⁹	Win 2K8 RHEL 5.6 SLES 11 SP1 ESX 4.1	V7K, DS3K DS5K
	Cisco® Nexus 4001I Switch Module (46M6071 or 46C9270)	Cisco Nexus 5010/5020 ²	Cisco	Win 2K8 RHEL 5.6 SLES 11 SP1 ESX 4.1	DS3K DS5K V7K

Notes:

- For full interoperability for IBM Converged Switch B32 (Brocade 8000), go to <http://www.ibm.com/systems/storage/san/b-type/library.html>
- For full interoperability for Cisco Nexus Switch for IBM System go to <http://www.ibm.com/systems/networking/switches/san/ctype/nexus/index.html>
- QLogic VFE must be used in Intelligent Passthru Mode
- Emulex VFA Basic (49Y4235) and VFA II Basic (90Y3550) can support FcoE via software upgrade
- Supported in pNIC Mode
- Use Full Fabric mode on Brocade 10Gb switch for direct attach to storage
- Use in Full Fabric mode on Qlogic VFE switch for direct attach to storage
- Only supported with ESX 4.1
- Supports both Full Fabric and Access Gateway Modes
- Not supported with Brocade Converged 10GbE Switch (69Y1909)

Table 39: FCoE Configuration Matrix supported in IBM Virtual Fabric Mode & Switch Independent Mode

Blade Converged Network Adapter (IBM PN)	BladeCenter Switch Module	FCoE Top of Rack Switch	Supported SAN Fabric	Supported OS	Supported IBM FC Storage
Supported in IBM Virtual Fabric Mode & Switch Independent Mode					
Choose From: 1) Emulex VFA II with Upgrade (PN 90Y3550 + 49Y4265) 2) Emulex VFA Advanced II (PN 90Y3566) 3) Emulex 10GbE VFA II for HS23 with Upgrade (PN 81Y3120 + 90Y9350) ¹¹ 4) Emulex 10GbE VFA Advanced II for HS23 (PN 90Y9332) ¹¹ 5) HS23 Integrated 10Gb VF LOM ¹⁰	IBM BladeCenter Virtual Fabric 10Gb Switch Module (46C7191) + QLogic Virtual Fabric Extension Module (46M6172)	Not Required	Not Required ⁷	Win 2K8 RHEL 5.6 SLES 11 SP1 ESX 4.1 vSphere 5.0	DS3K DS5K
	IBM BladeCenter Virtual Fabric 10Gb Switch Module (46C7191) + QLogic Virtual Fabric Extension Module (46M6172)	Not Required	Brocade ³	Win 2K8 RHEL 5.6 SLES 11 SP1 ESX 4.1 vSphere 5.0	DS3K DS5K V7K
	IBM BladeCenter Virtual Fabric 10Gb Switch Module (46C7191) + QLogic Virtual Fabric Extension Module (46M6172)	Not Required	Cisco ³	Win 2K8 RHEL 5.6 SLES 11 SP1 ESX 4.1 vSphere 5.0	DS3K DS5K V7K
	IBM BladeCenter Virtual Fabric 10Gb Switch Module (46C7191)	Cisco Nexus 5010/5020 ²	Cisco	Win 2K8 RHEL 5.6 SLES 11 SP1 ESX 4.1	V7K, DS8K, XIV, DS3K ⁸ , DS5K ⁸

Notes:

- For full interoperability for IBM Converged Switch B32 (Brocade 8000), go to <http://www.ibm.com/systems/storage/san/b-type/library.html>
- For full interoperability for Cisco Nexus Switch for IBM System go to <http://www.ibm.com/systems/networking/switches/san/ctype/nexus/index.html>
- QLogic VFE must be used in Intelligent Passthru Mode
- Emulex VFA Basic (49Y4235) and VFA II Basic (90Y3550) can support FcoE via software upgrade
- Supported in pNIC Mode
- Use Full Fabric mode on Brocade 10Gb switch for direct attach to storage
- Use in Full Fabric mode on Qlogic VFE switch for direct attach to storage
- Only supported with ESX 4.1
- Supports both Full Fabric and Access Gateway Modes
- The HS23 Integrated 10GbE Virtual Fabric supports 3 vPorts per 10Gb physical port. The CFFh version of the VFA supports four vPort devices but the Integrated VF only supports 3 vPorts because the 4th is used by the integrated 1Gb LOM port.
- Not supported with Brocade Converged 10GbE Switch (69Y1909)

Table 40: FCoE Configuration Matrix supported in Switch Independent Mode

Supported in Switch Independent Mode					
Choose From:					
1) Emulex VFA II with Upgrade (PN 90Y3550 + 49Y4265)	Brocade Converged 10GbE Switch (69Y1909)	Not Required	Not Required ⁶	Win 2K8 RHEL 5.6 SLES 11 SP1 ESX 4.1	DS3K DS5K
2) Emulex VFA Advanced II (PN 90Y3566)	Brocade Converged 10GbE Switch (69Y1909)	Not Required	Brocade ⁹	Win 2K8 RHEL 5.6 SLES 11 SP1 ESX 4.1	DS3K DS5K V7K
3) Emulex 10GbE VFA II for HS23 with Upgrade (PN 81Y3120 + 90Y9350) ¹¹	Cisco Nexus 4001I Switch Module (46M6071 or 46C9270)	Cisco Nexus 5010/5020 ²	Cisco	Win 2K8 RHEL 5.6 SLES 11 SP1 ESX 4.1	DS3K DS5K V7K
4) Emulex 10GbE VFA Advanced II for HS23	10Gb Ethernet Pass-Thru Module for IBM BladeCenter (46M6181)	Cisco Nexus 5010/5020 ²	Cisco	Win 2K8 R2 RHEL 6.2 SLES 10 SP4 ESX 4.1 U2	V7K, DS3K, DS5K, DS8K, XIV

Notes:

- For full interoperability for IBM Converged Switch B32 (Brocade 8000), go to <http://www.ibm.com/systems/storage/san/b-type/library.html>
- For full interoperability for Cisco Nexus Switch for IBM System go to <http://www.ibm.com/systems/networking/switches/san/ctype/nexus/index.html>
- QLogic VFE must be used in Intelligent Passthru Mode
- Emulex VFA Basic (49Y4235) and VFA II Basic (90Y3550) can support FcoE via software upgrade
- Supported in pNIC Mode
- Use Full Fabric mode on Brocade 10Gb switch for direct attach to storage
- Use in Full Fabric mode on Qlogic VFE switch for direct attach to storage
- Only supported with ESX 4.1
- Supports both Full Fabric and Access Gateway Modes
- The HS23 Integrated 10GbE Virtual Fabric supports 3 vPorts per 10Gb physical port. The CFFh version of the VFA supports four vPort devices but the Integrated VF only supports 3 vPorts because the 4th is used by the integrated 10Gb LOM port.
- Not supported with Brocade Converged 10GbE Switch (69Y1909)

FCoE Configuration Matrix for JS/PS Blade

Note: Not all Server, HBA, OS, SAN and Storage combinations are supported. Specific end to end FCoE configuration support must be verified through SSIC.

<http://www-03.ibm.com/systems/support/storage/ssic/interoperability.wss>

Table 41: FCoE Configuration Matrix for JS/PS Blades

Blade Converged Network Adapter (FC# for P, Option PN)	BladeCenter Switch Module	FCoE Top of Rack Switch	Supported SAN Fabric	Supported OS	Supported IBM FC Storage
QLogic CNA (FC#8275 , 42C1830)	10Gb Ethernet Pass-Thru Module (FC#5412)	IBM Converged Switch B32 (Brocade 8000) ¹	Brocade	See Note 3	DS3K DS5K DS8K V7K SVC XIV Tape
QLogic CNA (FC#8275 , 42C1830)	10Gb Ethernet Pass-Thru Module (FC#5412)	Cisco Nexus 5010/5020 ²	Cisco	See Note 5	DS3K DS5K DS8K V7K SVC XIV Tape
QLogic CNA (FC#8275 , 42C1830)	IBM BladeCenter Virtual Fabric 10Gb Switch Module (FC#3248)	TOR w/NIC traffic only	N/A	See Note 4	N/A
QLogic CNA (FC#8275, 42C1830)	IBM BladeCenter Virtual Fabric 10Gb Switch Module (FC#3248) + QLogic Virtual Fabric Extension Module (FC#3268) 6	TOR not required ^{1, 2}	Cisco/ Brocade	See Note 7	DS3K DS5K DS8K V7K SVC XIV Tape
QLogic CNA (FC#8275 , 42C1830)	Cisco® Nexus 4001I Switch Module (FC#2241, 2242) ⁸	Cisco Nexus 5010/5020 ²	Cisco	See Note 7	DS8K
QLogic CNA (FC#8275 , 42C1830)	Brocade Converged 10GbE Switch Module (69Y1909) ¹⁰	N/A	Brocade SAN Fabric ¹⁰	See Note 9	DS3K DS5K DS8K V7K SVC XIV Tape

Notes:

- For full interoperability for IBM SAN b-type switches, go to <http://www.ibm.com/systems/storage/san/b-type/library.html>. Refer to 3rd party providers for 3rd party storage support information.
- For full interoperability for Cisco Nexus Switch for IBM System go to <http://www.ibm.com/systems/networking/switches/san/ctype/nexus/index.html> . Refer to 3rd party providers for 3rd party storage support information.
- Support for NPV with VIOS 2.1.3.0, AIX 5.3 TL 12 and 6.1 TL 5 or later. Also IBMi 6.1.1 or 7.1 TR1 with VIOS 2.2.0.0
- Supports VIOS 2.1.3.0, AIX 5.3 TL 12 and 6.1 TL 5 or later .
- Support for NPV with VIOS 2.1.3.0 and AIX 6.1 TL6 SP3 or later. Also IBMi 6.1.1 or 7.1 TR1 with VIOS 2.2.0.0
- Requires IBM FW 6.5.0.29, Qlogic FW V9.0.3.2.0, or later levels. Must be through Intelligent Pass Through Mode through QLogic Virtual Fabric Extension Module.
- Requires IBMi 6.1.1 or 7.1 TR1, VIOS 2.2.0.0, AIX5.3.TL12, AIX 6.1.TL5, AIX 7.1, QLogic CNA FW 010203; or later levels. Host side NPV is supported.
- Requires Nexus 4001 FW level 4.1(2)E1(1d) or later level
- Requires VIOS 2.2.0.0, AIX5.3.TL12, AIX 6.1.TL6, AIX 7.1, QLogic CNA FW 010203; or later levels. Host side NPV is supported.
- Requires Brocade FW 6.3.1_000, or later level

Switch to Transceiver Interoperability

Table 42: Switch to Transceiver Interoperability - Table 1

Option Part Number// Feature code for P	I/O Module																		
	Ethernet	32R1877	IBM 10GBase-SR XFP	44W4408	//3282 10GBase-SR 10GbE 850 nm Fiber ok. +	81Y1618	IBM SFP RJ45 Transceiver (1Gb)	81Y1622	IBM SFP SX Transceiver (1Gb)	90Y9424	IBM SFP LX Transceiver (1Gb)	46C3447	IBM SFP+ SR Transceiver (10Gb)	90Y9412	IBM SFP+ LR Transceiver (10Gb)	90Y9415	IBM SFP+ ER Transceiver (10Gb)	JXP-01LWAA1	JDSU 10Gbase-LR XFP (requires SW ver. 1.2.5.1 or newer)
32R1861	IBM Layer 2/3 Fiber Gb Ethernet Switch	-	-	-	-	Y	Y	-	-	-	-	-	-	-	-	-	-	-	-
32R1888	Cisco Systems Intelligent Gb Fiber Ethernet Switch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39Y9267	IBM 6-port 10G Ethernet Switch Module	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	-
41Y8522/ 00Y3250	Cisco Catalyst Switch Module 3110X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
43W4395/ 46C9272	Cisco Catalyst Switch Module 3012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
41Y8523/ 00Y3254	Cisco Catalyst Switch Module 3110G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
44W4404	IBM 1/10 Gb Uplink Ethernet Switch Module	-	Y	-	-	-	-	-	-	Y	Y	-	-	-	-	-	-	-	-
	10Gb/s Ethernet (Supporting Fibre Channel over Ethernet (FCoE))																		
46C7191	IBM BladeCenter Virtual Fabric 10 GbE Switch Module	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	-	-	-
46M6071/ 46C9270	Cisco Nexus 4001I Switch Module	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
46M6172	QLogic Virtual Fabric Extension Module	Y	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
46M6181	10Gb Ethernet Pass-Thru Module	-	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 43: Switch to Transceiver Interoperability - Table 2

Option Part Number// Feature code for P	I/O Module	Cisco X2-10GB-CX4	Cisco X2-10GB-SR	Cisco SFP-H10GB-CU1M	Cisco SFP-H10GB-CU3M	Cisco SFP-H10GB-CU5M	Cisco X2-10GB-LX4	88Y6058 Cisco 1000BASE-T SFP (GLC-T)	88Y6062 Cisco 1000BASE-SX SFP (GLC-SX-MM)	88Y6054 Cisco 10GBASE-SR SFP+ (SFP-10G-SR)	GE SFP, LC connector LX/LH (GLC-LH-SM)	45W2398 Copper Direct Attach Cable – 1M	45W2408 Copper Direct Attach Cable – 3M	45W3039 Copper Direct Attach Cable – 5M	
		Ethernet													
32R1861	IBM Layer 2/3 Fiber Gb Ethernet Switch	-	-	-	-	-	-	-	-	-	-	-	-	-	
32R1888	Cisco Systems Intelligent Gb Fiber Ethernet Switch	-	-	-	-	-	-	-	-	-	-	-	-	-	
39Y9267	IBM 10G Ethernet Switch Module	-	-	-	-	-	-	-	-	-	-	-	-	-	
41Y8522/00Y3250	Cisco Catalyst Switch Module 3110X	Y	Y	-	-	-	Y	Y	Y	Y	-	-	-	-	
43W4395/46C9272	Cisco Catalyst Switch Module 3012	-	-	-	-	-	-	-	-	-	-	-	-	-	
41Y8523/00Y3254	Cisco Catalyst Switch Module 3110G	-	-	-	-	-	-	-	-	-	-	-	-	-	
44W4404	IBM 1/10 Gb Uplink Ethernet Switch Module	-	-	-	-	-	-	-	-	-	-	Y	Y	Y	
	10Gb/s Ethernet (Supporting Fibre Channel over Ethernet (FCoE))														
46C7191	IBM BladeCenter Virtual Fabric 10GbE Switch Module	-	-	-	-	-	-	-	-	-	-	Y	Y	Y	
46M6071/46C9270	Cisco Nexus 4001I Switch Module	-	-	Y	Y	Y	-	Y	Y	Y	Y	-	-	-	
46M6172	QLogic Virtual Fabric Extension Module	-	-	-	-	-	-	-	-	-	-	-	-	-	
46M6181	10Gb Ethernet Pass-Thru Module	-	-	Y	Y	Y	-	-	-	-	-	Y	Y	Y	

Table 44: Switch to Transceiver Interoperability - Table 3

Option Part Number // Feature code for P	I/O Module																
		22R4902 4 Gbps SW SFP Transceiver	44x1962 //5358 Brocade 8Gb SFP+ SW Optical Xcvr	49&4216 Brocade 10Gb SFP+ SR Optical Transceiver	45W0493 SFP Transceiver 4 Gbps SW	45W0495 SFP Transceiver 4 Gbps 10Km LW	45W0499 SFP Transceiver 4 Gbps 30Km ELW	45W0494 SFP Transceiver 4 Gbps 4Km LW	45W1216 SFP Transceiver 8 Gbps 10 km LW	45W0500 SFP Transceiver 8 Gbps SW	41Y8598 //3261 Cisco Systems 4Gb SW SFP	39R6475//3238 4-Gbps SW SFP Transceiver	26K7941 Short Wave 4Gb SFP pair	44X1964//3286 8Gb SFP+ SW Optical Transceiver	23R1703 SFP Transceiver 4 Gbps 4 km LW	23R1704 SFP Transceiver 4 pk 4 Gbps 4 km LW	22R4897 SFP Transceiver 4 pk 4 Gbps SW
	Fibre Channel																
32R1812	Brocade 20 port – 4Gb SAN Switch	Y	-	-	Y	-	-	-	-	-	-	Y	Y	-	-	-	-
32R1813	Brocade 10 port – 4Gb SAN Switch	Y	-	-	Y	-	-	-	-	-	-	Y	Y	-	-	-	-
39Y9280/44E5696	Cisco Systems 4Gb 20 port Fibre Channel Switch Module	-	-	-	-	-	-	-	-	-	Y	-	-	-	-	-	-
39Y9284/44E5692	Cisco Systems 4Gb 10 port Fibre Channel Switch Module	-	-	-	-	-	-	-	-	-	Y	-	-	-	-	-	-
43W6723	4Gb Intelligent Pass-thru Module for IBM BladeCenter	Y	-	-	-	-	-	-	-	-	-	Y	Y	-	-	-	-
43W6724	QLogic 10 port – 4Gb SAN Switch Module	Y	-	-	-	-	-	-	-	-	-	Y	Y	-	-	-	-
43W6725	QLogic 20 port – 4Gb SAN Switch Module	Y	-	-	-	-	-	-	-	-	-	Y	Y	-	-	-	-
88Y6406	QLogic(R) 20-port 4/8 Gb SAN Switch Module	Y	-	-	-	-	-	-	-	-	-	Y	Y	Y	Y	Y	Y
88Y6410	QLogic(R) 4/8 Gb Intelligent Pass-thru Module	Y	-	-	-	-	-	-	-	-	-	Y	Y	Y	Y	Y	Y
44X1905	QLogic(R) 20-port 8 Gb SAN Switch Module	Y	-	-	-	-	-	-	-	-	-	Y	Y	Y	Y	Y	Y
44X1907	QLogic(R) 8 Gb Intelligent Pass-thru Module	Y	-	-	-	-	-	-	-	-	-	Y	Y	Y	Y	Y	Y
44X1920	Brocade 20-port 8Gb SAN Switch Module	-	Y	-	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-
44X1921	Brocade 10-port 8Gb SAN Switch Module	-	Y	-	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-
42C1828	Brocade 20-port Enterprise 8Gb SAN Switch Module	-	Y	-	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-
	10Gb/s Ethernet (Supporting Fibre Channel over Ethernet (FCoE))																
46M6172	QLogic Virtual Fabric Extension Module	Y	-	-	-	-	-	-	-	-	-	Y	Y	Y	Y	Y	Y
69Y1909	Brocade Converged 10GbE Switch Module	-	Y	Y	-	-	-	-	Y	-	-	-	-	-	-	-	-

Fibre Channel NPIV Support Matrix on JS and PS Blades

Table 45: Fibre Channel NPIV Support Matrix on JS and PS Blades

NPIV Compatibility Matrix	AIX Client			IBM i Client			Linux Client		
	QLogic 8Gb CIOv Feature Code #8242 ¹	QLogic 8Gb CFFh Feature Code #8271 ¹	Emulex 8Gb CIOv Feature Code #8240	QLogic 8Gb CIOv Feature Code #8242 ¹	QLogic 8Gb CFFh Feature Code #8271 ¹	Emulex 8Gb CIOv Feature Code #8240	QLogic 8Gb CIOv Feature Code #8242 ¹	QLogic 8Gb CFFh Feature Code #8271 ¹	Emulex 8Gb CIOv Feature Code #8240
QLogic 4Gb Switch Modules Feature Codes #3243, #3244 ²	N	N	N	N	N	N	N	N	N
QLogic 8Gb Switch Module Feature Code #3284 & 4/8Gb Switch Module Option PN 88Y6406 ³	Y	Y	N	Y ⁸	Y ⁸	N	Y	Y	N
Brocade 4Gb Switch Modules Feature Codes #3206, #3207	N	N	Y ⁵	N	N	Y ⁴	N	N	Y
Brocade 8Gb Switch Modules Feature Codes #5045, #5869, Option# 42C1828	Y	Y	Y	Y ⁸	Y ⁸	Y ⁴	Y	Y	Y
Cisco 4Gb Switch Module Feature Code #3242	Y ⁷	Y ⁷	Y ⁶	Y ¹⁰	Y ¹⁰	Y ⁴	N	N	N
Qlogic 8Gb Int. Passthrough Module Feature Code #5449 & 4/8Gb Passthrough Module Option PN 88Y6410	Y ⁹	Y ⁹	N	N	N	N	N	N	N

Notes :

- Requires firmware version level 5.02.01 or later
- Requires firmware version level 6.5.0.22.00 or later
- Requires firmware version level 7.10.1.04 or later
- Virtual Tape only with VIOS 2.1.2 or later
- Requires AIX 6.1 TL5 and AIX 5.3 TL12, Emulex adapter FW level 1.11A8 and Brocade switch firmware level v6.2.1b ; or later levels.
- Requires AIX 6.1 TL5 or AIX 5.3 TL11 or later levels, Emulex adapter FW 1.11A8 and Cisco switch firmware level v4.2(3); or later levels.
- Requires VIOS 2.1.2, AIX 5.3 TL 12 , AIX 6.1 TL5, 4Gb Cisco SM FW v4.2.3 , Qlogic 8Gb FC adapter FW 0314050309, or later levels
- DS8000 support requires Qlogic 8Gb FC adapter FW 0314050309 or later
- Requires VIOS 2.1.3, AIX 6.1 TL6, AIX 7.1, 8Gb IPM FW level 7.10.1.4.0 or later levels
- Requires VIOS 2.2.0 , IBM i 6.1.1 and 7.1, Cisco 4G SM FW 3.3 (2), or later levels

Other Options

BladeCenter S SAS RAID Controller Module Support; Hardware, Software and Blade Interoperability

The IBM BladeCenter S SAS RAID Module Interoperability Matrix is a separate document that contains the detailed information for the SAS RAID Module.

SAS RAID Module Interoperability – How to obtain the document

Find from SAS RAID Module ibm.com support page.

1. Go to: <http://www.ibm.com/support/entry/portal/docdisplay?Indocid=MIGR-5078491>
2. Click “Guide” Link for "SAS RAID Module - Interoperability Guide"
3. View / Download: "SAS RAID Module Interoperability Guide"

Notes:

1. REQUIRED ACTION: Review SAS RAID Module Support website prior to installing the BladeCenter S SAS RAID Module. This website contains links and documentation for all requirements related to the SAS RAID Module option.

Direct link to SAS RAID Module support page.

Go to: <http://www.ibm.com/support/entry/portal/docdisplay?Indocid=MIGR-5078491>

2. One Battery Backup Module is provided/included with each SAS RAID Module (43W3584/3734)
3. SAS RAID Module requires a Host SAS Adapter. Details about the Host SAS Adapters are contained in the SAS RAID Module Interoperability Guide.

Tape on BladeCenter Solution Requirements

Note:

The IBM SAS RAID Controller Module when used in the BCS chassis only supports specific tape models which is detailed in the SAS RAID Module Interoperability Guide

Table 46: Tape on BladeCenter Solution Requirements - Table 1

System x Tape Description (Machine Type or Part Number)	Comments
BladeCenter Chassis S (8886, 7779), E (8677), H (8852, 7989)	Supported Chassis'
HX5 (7872), HS21 (8853), HS21 XM (7995), LS21 (7971), LS41 (7972), HS22 (7870), HS23 (7875), LS22 (7901), LS42 (7902)	Supported Blades
HH LTO3 (43W8478), HH LTO4 (44E8895)	Supported Tape Devices. Must be housed in a Tape Enclosure
Tape Enclosures (8767HHX, 8767HNX, 87651UX, 87651NX, 87664UX, 87664NX)	Supported Tape Enclosures
IBM BladeCenter SAS Connectivity Module (39Y9195)	One in each chassis
SAS Expansion Card (CFFv) for IBM BladeCenter (39Y9190)	One in each blade

Table 47: Tape on BladeCenter Solution Requirements - Table 2

Storage Group Tape Description (Machine Type or Part Number)	Comments
BladeCenter Chassis S (8886), E (8677), T (DC 8720, AC 8730), H (8852, 7989), HT (8740, 8750)	Supported Chassis'
Blades HX5 (7872), HS21 (8853), HS21 XM (7995), HS23 7875), LS21 (7971), LS22 (7901), LS42 (7902)	Supported Blades
Tape Devices TS3100/3200, TS2230, TS2240, TS2900, TS3310	Supported Tape Devices
IBM BladeCenter SAS Connectivity Module (39Y9195)	One in each chassis
SAS Expansion Card (CFFv, 39Y9190)	One in each blade

Table 48: Tape on BladeCenter Solution Requirements - Table 3

Storage Group Tape Description (Machine Type or Part Number)	Comments
BladeCenter Chassis S (8886), E (8677), T (DC 8720, AC 8730), H (8852, 7989), HT (8740, 8750)	Supported Chassis'
Blades HX5 (7872, 7873), HS22 (7870), HS23 (7875)	Supported Blades
Tape Devices TS3100/3200, TS2230, TS2240, TS3310, TS3500	Supported Tape Devices
SAS Connectivity Card (CIOv, 43W4068)	One in each blade

Table 49: Tape on BladeCenter Solution Requirements - Table 4

Storage Group Tape Description (Machine Type or Part Number)	Comments
BladeCenter Chassis S (8886, 7779), H (8852, 7989), HT (8740, 8750)	Supported Chassis'
Blades JS23 (7778), JS43 (7778), PS700 (8406-70Y), PS701 (8406-71Y), PS702 (8406-71Y), PS703 (7891-73X), PS704 (7891-74X)	Supported Blades
Tape Devices TS2900, TS3100/3200, TS3310, TS2230, TS2240, TS2250, TS2350	Supported Tape Devices
SAS Connectivity Card (CIOv, 43W4068)	One in each blade

Table 50: Tape on BladeCenter Solutions Requirements - Table 5

Storage Group Tape Description (Machine Type or Part Number)	Comments
BladeCenter Chassis S (8886, 7779), H (8852, 7989), HT (8740, 8750), E (8677) T (DC 8720, AC 8730) – JS12 ONLY	Supported Chassis'
Blades JS12 (7998-60X), JS22 (7998-61X)	Supported Blades
Tape Devices TS2900, TS3100/3200, TS3310, TS2230, TS2240, TS2250, TS2350	Supported Tape Devices
SAS Expansion Card (CFFv, 39Y9190 / 8250)	One in each blade

Table 51: Tape on BladeCenter Solutions Requirements - Table 6

Storage Group Tape Description (Machine Type or Part Number)	Comments
BladeCenter Chassis S (8886), E (8677), H (8852, 7989)	Supported Chassis'
Blades HX5 (7872, 7873), HS21 (8853), HS21 XM (7995), HS22 (7870), HS23 (7875), LS21 (7971), LS41 (7972) LS22 (7901), LS42 (7902)	Supported Blades
Tape Devices TS3100/3200, TS2230, TS2240, TS3310, TS3500	Supported Tape Devices
Emulex 4Gb Fibre Channel Expansion Card (CFFv, 3W6859) Qlogic 4Gb Fiber Channel Expansion Card (CFFv, 41Y8527) Qlogic Ethernet and 4Gb Fiber Channel Expansion Card (CFFh, 39Y9306) Qlogic CFFh 8Gb Fibre Channel/10Gb Fnet Expansion Card (44X1940)	One in each blade

Table 52: Tape on BladeCenter Solutions Requirements - Table 7

Storage Group Tape Description (Machine Type or Part Number)	Comments
BladeCenter Chassis S (8886), E (8677), H (8852, 7989)	Supported Chassis'
Blades HX5 (7872, 7873), HS22 (7870), HS23 (7875)	Supported Blades
Tape Devices TS3100/3200, TS2230, TS2240, TS3310, TS3500	Supported Tape Devices
QLogic CFFh 8Gb Fibre Channel/10Gb Enet Expansion Card (44X1940) Emulex 1XE 8Gb Fiber Channel Expansion Card (46M6140) QLogic 1XE 4Gb Fibre Channel Expansion Card (46M6065) QLogic 1XE 8Gb Fibre Channel Expansion Card for BladeCenter (44V1945)	One in each blade

Table 53: Tape on BladeCenter Solutions Requirements - Table 8

Storage Group Tape Description (Machine Type or Part Number)	Comments
BladeCenter Chassis S (8886, 7779), H (8852, 7989), HT (8740, 8750)	Supported Chassis'
Blades JS23 (7778), JS43 (7778), PS700 (8406-70Y), PS701 (8406-71Y), PS702 (8406-71Y), PS703 (7891-73X), PS704 (7891-74X)	Supported Blades
Tape Devices TS2900, TS3100/3200, TS3310, TS3500, TS2230, TS2240, TS2350	Supported Tape Devices
QLogic CFFh 8Gb Fibre Channel/1Gb Enet Expansion Card (44X1940 / 8271) QLogic Ethernet and 4Gb Fibre Channel Expansion Card (CFFh) (39Y9306 / 8252) Emulex 1XE 8Gb Fiber Channel Expansion Card (46M6140/8240) QLogic 1XE 4Gb Fibre Channel Expansion Card (46M6065/8241) QLogic 1XE 8Gb Fibre Channel Expansion Card for BladeCenter (44X1945/8242) QLogic 2-port 10Gb Converged Network Adapter (CFFh) for IBM BladeCenter (42C1830/8275)	One in each blade

Table 54: Tape on BladeCenter Solutions Requirements - Table 9

Storage Group Tape Description (Machine Type or Part Number)	Comments
BladeCenter Chassis S (8886, 7779), H (8852, 7989), HT (8740, 8750), E (8677) T (DC 8720, AC 8730) – JS12 ONLY	Supported Chassis'
Blades JS12 (7998-60X), JS22 (7998-61X)	Supported Blades
Tape Devices TS3100/3200, TS3310, TS3500	Supported Tape Devices
QLogic CFFh 8Gb Fibre Channel/1Gb Enet Expansion Card (44X1940 / 8271) QLogic Ethernet and 4Gb Fibre Channel Expansion Card (CFFh) (39Y9306 / 8252) Emulex 4Gb Fibre Channel Expansion Card (CFFv) (43W6859 / 8251) QLogic 4Gb Fibre Channel Expansion Card (CFFv) (41Y8527 / 8248) QLogic 2-port 10Gb Converged Network Adapter (CFFh) for IBM BladeCenter (42C1830 / 8275)	One in each blade

Table 55: Tape on BladeCenter Solutions Requirements - Table 10

Storage Group Removable Media Description (Machine Type or Part Number)	Comments
BladeCenter Chassis S (8886, 7779), H (8852, 7989)	Supported Chassis
Blades PS700 (8406-70Y), PS701 (8406-71Y), PS702 (8406-71Y), PS703 (7891-73X), PS704 (7891-74X)	Supported Blades
7216 -1U2 Removable Media Device Drawer with: FC 8247 2 - LTO5 SAS Drive FC 5619 2- DAT160 SAS Drive FC 1103 1 - RDX USB 2.0 docking station with: FC 1106, FC 1107	Supported Devices
FC 1104 ¹ - External RDX USB 2.0 docking station with: FC 1106, FC 1107	Supported Devices
SAS Connectivity Card (CIOv, 43W4068) or embedded USB port	One in each blade

Notes:

1. VIOS and IBMi not supported
2. Chassis requires SAS Connectivity Module feature code# 3267

BladeCenter Tape Interoperability

Table 56: BladeCenter Tape Interoperability

	Blades	Tape Product
Red Hat Linux		
Red Hat Enterprise Linux 4 for x86	HS21 (8853), HS21 XM (7995), LS21 (7971), LS41 (7972), HS22 (7870), LS22 (7901), LS42 (7902)	HH LTO3 (43W8478), HH LTO4 (44E8895), TS3100/3200, TS2230, TS2240, TS2900, TS3310, TS3500
Red Hat Enterprise Linux 4 for AMD64/EM64T	HS21 (8853), HS21 XM (7995), LS21 (7971), LS41 (7972), HS22 (7870), LS22 (7901), LS42 (7902)	HH LTO3 (43W8478), HH LTO4 (44E8895), TS3100/3200, TS2230, TS2240, TS2900, TS3310, TS3500
Red Hat Enterprise Linux 5 for x86	HS21 (8853), HS21 XM (7995), LS21 (7971), LS41 (7972), HS22 (7870), LS22 (7901), LS42 (7902)	HH LTO3 (43W8478), HH LTO4 (44E8895), TS3100/3200, TS2230, TS2240, TS2900, TS3310, TS3500
Red Hat Enterprise Linux 5 for AMD64/EM64T	HX5 (7872, 7873), HS21 (8853), HS21 XM (7995), LS21 (7971), LS41 (7972), HS22 (7870), LS22 (7901), LS42 (7902)	HH LTO3 (43W8478), HH LTO4 (44E8895), TS3100/3200, TS2230, TS2240, TS2900, TS3310, TS3500
Novell SUSE LINUX		
SUSE LINUX Enterprise Server 9 for x86	HS21 (8853), HS21 XM (7995), LS21 (7971), LS41 (7972), HS22 (7870), LS22 (7901), LS42 (7902)	HH LTO3 (43W8478), HH LTO4 (44E8895)
SUSE LINUX Enterprise Server 9 for AMD64/EM64T	HS21 (8853), HS21 XM (7995), LS21 (7971), LS41 (7972), HS22 (7870), LS22 (7901), LS42 (7902)	HH LTO3 (43W8478), HH LTO4 (44E8895)
SUSE LINUX Enterprise Server 10 for x86	HS21 (8853), HS21 XM (7995), LS21 (7971), LS41 (7972), HS22 (7870), LS22 (7901), LS42 (7902)	HH LTO3 (43W8478), HH LTO4 (44E8895), TS3100/3200, TS2230, TS2240, TS2900, TS3310, TS3500
SUSE LINUX Enterprise Server 10 for AMD64/EM64T	HS21 (8853), HS21 XM (7995), LS21 (7971), LS41 (7972), HS22 (7870), LS22 (7901), LS42 (7902)	HH LTO3 (43W8478), HH LTO4 (44E8895), TS3100/3200, TS2230, TS2240, TS2900, TS3310, TS3500
IBM		
AIX Version 5.3	JS12, JS21, JS22 (7998), JS23/43 (7778) PS700 (8406-70Y), PS701 (8406-71Y), PS702 (8406-71Y), PS703 (7891-73X), PS704 (7891-74X)	TS2900, TS3100/3200, TS2230, TS2240, TS2250, TS3310, TS3500
AIX Version 6.1	JS12, JS22 (7998), JS23/43 (7778) PS700 (8406-70Y), PS701 (8406-71Y), PS702 (8406-71Y), PS703 (7891-73X), PS704 (7891-74X)	TS2900, TS3100/3200, TS2230, TS2240, TS2250, TS3310, TS3500
IBM i 6.1.1 and 7.1 ¹	JS12, JS22 (7998), JS23/43 (7778) PS700 (8406-70Y), PS701 (8406-71Y), PS702 (8406-71Y), PS703 (7891-73X), PS704 (7891-74X)	TS2240, TS2250, TS2900 with LTO4 or LTO5 tape drives (sequential mode only)
IBM i 6.1.1 and 7.1 ²	JS12, JS22 (7998), JS23/43 (7778) PS700 (8406-70Y), PS701 (8406-71Y), PS702 (8406-71Y), PS703 (7891-73X), PS704 (7891-74X)	TS3100/TS3200/TS3310/TS3500 with LTO3, LTO4, LTO5 tape drives, TS3400/TS3500 with TS1120, TS1130, TS1140 tape drives, TS3500 with 3592-J1A, TS1120, TS1130, TS1140 tape drives
Microsoft		
Microsoft Windows Server 2003	HS21 (8853), HS21 XM (7995), LS21 (7971), LS41 (7972), HS22 (7870), LS22 (7901), LS42 (7902)	HH LTO3 (43W8478), HH LTO4 (44E8895), TS3100/3200, TS2230, TS2240, TS2900, TS3310, TS3500
Microsoft Windows Server 2008	HX5 (7872, 7873), HS21 (8853), HS21 XM (7995), LS21(7971), HS22 (7870), LS22 (7901), LS42 (7902)	HH LTO3 (43W8478), HH LTO4 (44E8895), TS3100/3200, TS2230, TS2240, TS2900, TS3310, TS3500

Notes:

1. TS2240 requires VIOS 2.1.1, TS2250 requires VIOS 2.1.3, TS2900 requires VIOS 2.2.1 or later levels
2. Requires VIOS 2.1.3 or later using NPIV. For supported NPIV HBAs and Switch Modules see “Fibre Channel NPIV Support Matrix on JS Blades” in this document.

Server Drive Compatibility

Table 57: Server Drive Compatibility – Table 1

Option Part Number / Feature Code for x / Feature Code for p	Drives	HX5	HS12	HS21	HS21 XM	HS22	HS22V	HS23	HS23E	LS22	LS42
	Solid State										
43W7618	ServerBlade 31.4GB SSD SATA 2.5" NHS	-	Y ²	-	Y	-	-	-	-	Y ¹	Y ¹
43W7648	31.4GB SSD SATA 2.5" Slim-HS	-	Y ³	-	-	Y	-	-	-	-	-
43W7706	50 GB SATA 2.5" SFF NHS High IOPS SSD	-	-	Y	Y	-	-	-	-	Y	Y
43W7714	50GB SATA 2.5" SFF Slim-HS High IOPS SSD	-	-	-	-	Y	-	-	-	-	-
43W7718	200GB SATA 2.5" SFF Slim-HS SSD	-	-	-	-	-	-	Y	Y	-	-
43W7734	50GB SATA 1.8" NHS SSD	Y ⁴	-	-	-	-	Y	-	-	-	-
49Y5839	IBM 64GB SATA 2.5" MLC HS Enterprise Value SSD	-	-	-	-	Y	-	Y	Y	-	-
49Y5844	IBM 512GB SATA 2.5" MLC HS Enterprise Value SSD	-	-	-	-	Y	-	Y	Y	-	-
90Y8643	256GB SATA 2.5" SFF HS SSD	-	-	-	-	-	-	Y	-	-	-
90Y8648	128GB SATA 2.5" SFF HS SSD	-	-	-	-	-	-	Y	-	-	-
	Flash										
39R8697	4GB Modular Flash Drive	-	-	-	Y	-	-	-	-	-	-
43W3934	8GB Modular Flash Drive	-	-	-	Y	-	-	-	-	-	-
60H4324	8GB Modular Flash Drive	-	-	-	-	-	-	-	-	-	-
	Hot Swap										
39R7388	36GB 10K SAS SFF HS in BSE-3 with	-	Y	Y	Y	-	-	-	-	-	-
39R7389	73GB 10K SAS SFF HS in BSE-3 with	-	Y	Y	Y	-	-	-	-	-	-
42D0632	146GB 10K 6Gbps SAS 2.5" SFF Slim-HS	-	Y ³	-	-	Y	-	-	-	-	-
42D0637	300GB 10K 6Gbps SAS 2.5" SFF Slim-HS	-	Y ³	-	-	Y	-	-	-	-	-
42D0672	73GB 15K 6Gbps SAS 2.5" SFF Slim-HS	-	Y ³	-	-	Y	-	-	-	-	-
42D0677	146GB 15K 6Gbps SAS 2.5" SFF Slim-HS	-	Y ³	-	-	Y	-	-	-	-	-
42D0747	160GB 7200 NL SATA 2.5" SFF Slim-HS HDD	-	Y ³	-	-	Y	-	-	-	-	-
42D0752	500GB 7200 NL SATA 2.5" SFF Slim-HS HDD	-	Y ³	-	-	Y	-	-	-	-	-
43W7535	73GB 10K SAS SFF SAS Slim-HS	-	Y ³	-	-	Y	-	-	-	-	-
43W7536	146GB 10K SAS SFF SAS Slim-HS	-	Y ³	-	-	Y	-	-	-	-	-
43W7545	73GB 15K SAS SFF SAS Slim-HS	-	Y ³	-	-	Y	-	-	-	-	-
43W7670	300GB 10K SATA 2.5" Slim-HS HDD	-	Y ³	-	-	Y	-	-	-	-	-
43X0853	73GB SAS 15K 2.5" SFF HS DD-SAS in SIO with	-	Y	Y	Y	-	-	-	-	-	-
81Y9650	900GB 10K 6Gbps SAS 2.5" Slim-HS HDD	-	-	-	-	-	-	Y	Y	-	-
81Y9670	300GB 15K 6Gbps SAS 2.5" Slim-HS HDD	-	-	-	-	-	-	Y	Y	-	-
81Y9690	1TB 7.2K 6Gbps NL SAS 2.5" SFF Slim-HS HDD	-	-	-	-	-	-	Y	Y	-	-
81Y9722	250GB 7.2K 6Gbps SATA 2.5" SFF Slim-HS HDD	-	-	-	-	-	-	Y	Y	-	-
81Y9726	500GB 7.2K 6Gbps SATA 2.5" SFF Slim-HS HDD	-	-	-	-	-	-	Y	Y	-	-
81Y9730	1TB 7.2K 6Gbps SATA 2.5" SFF Slim-HS HDD	-	-	-	-	-	-	Y	Y	-	-
90Y8872	600GB 10K 6Gbps SAS 2.5" SFF G2HS HDD	-	-	-	-	-	-	Y	Y	-	-
90Y8877	300GB 10K 6Gbps SAS 2.5" SFF G2HS HDD	-	-	-	-	-	-	Y	Y	-	-
90Y8926	146GB 15K 6Gbps SAS 2.5" SFF G2HS HDD	-	-	-	-	-	-	Y	Y	-	-
90Y8953	500GB 7.2K 6Gbps NL SAS 2.5" SFF G2HS HDD	-	-	-	-	-	-	Y	Y	-	-

Notes:

1. Code level to support SSD's on linux on the LS22/42 is LSI 1064e SAS Controller BIOS and firmware update v2.50
2. HS12 Machine Type 8014 only
3. HS12 Machine Type 8028 only
4. SSD Expansion Card for IBM BladeCenter HX5 (Option PN 46M6908) is required.

Table 58: Server Drive Compatibility – Table 2

Option Part Number / Feature Code for x / Feature Code for p	Drives	JS12	JS22	JS23	JS43	PS700	PS701/702	PS703/704	PN41	QS21	QS22
	Solid State										
//8207	177GB SSD 1.8" SATA	-	-	-	-	-	-	Y ¹	-	-	-
	Flash										
43W3934	8GB Modular Flash Drive	-	-	-	-	-	-	-	-	-	Y
60H4324	8GB Modular Flash Drive	-	-	-	-	-	-	-	-	-	Y

Notes:

1. Requires FC# 4539 SSD Interposer Carrier. FC#8207 is not supported in BCH slots 13 and 14.

Table 59: Server Drive Compatibility – Table 3

Option Part Number / Feature Code for x / Feature Code for p	Drives	HX5	HS12	HS21	HS21XM	HS22	HS22V	HS23	HS23E	LS22	LS42
	Other										
26K5776	36GB 10K SFF SAS NHS	-	-	Y	Y	-	-	-	-	-	-
26K5777	73GB 10K SFF SAS NHS	-	-	Y	Y	-	-	-	-	Y	Y
41Y8268	USB Memory Key for VMware ESXi 3.5 U3	-	-	-	-	-	-	-	-	Y	Y
41Y8269	USB Memory Key for VMware ESXi 3.5 U4	-	-	-	-	Y ²	Y ²	-	-	Y	Y
41Y8278	USB Memory Key for VMware ESXi	Y ³	-	-	-	Y ³	Y ³	-	-	-	-
41Y8298	USB Memory Key for VMWare Hypervisor	-	-	-	-	-	-	Y	Y	-	-
41Y8300	USB Memory Key for VMWare vSphere 5.0	-	-	-	-	-	-	Y	Y	-	-
41Y8307	IBM USB Memory Key for VMware ESXi 5.0 Update1	Y	-	-	-	Y	Y	Y	-	-	-
42D0421	146GB SAS 10K SFF NHS	-	-	Y	Y	-	-	-	-	Y	Y
42D0627//8274	300GB 10K 6Gbps SAS 2.5" SFF NHS HDD	-	-	Y	Y	-	-	-	-	Y	Y
42D0667	146GB 15K 6Gbps SAS 2.5" SFF NHS HDD	-	-	Y	Y	-	-	-	-	Y	Y
42D0737	160GB 7200 NL SATA 2.5" SFF NHS HDD	-	Y ¹	Y	Y	-	-	-	-	Y	Y
42D0742	500GB 7200 NL SATA 2.5" SFF NHS HDD	-	Y ¹	Y	Y	-	-	-	-	Y	Y
43W7640	80GB 7200 SATA ED 2.5" NHS	-	Y ¹	-	-	-	-	-	-	-	-
43W7666	300GB 10K SATA 2.5" NHS HDD	-	-	Y	Y	-	-	-	-	Y	Y
43X0845	73GB SAS 15K SFF Blade Option	-	-	Y	Y	-	-	-	-	Y	Y
39R7563	IBM BladeCenter Storage and I/O Expansion Blade	-	Y ¹	Y	Y	-	-	-	-	Y	Y
	IBM RDX Removable Hard Disk Storage System										
362516X// 1106	IBM RDX 160 GB External USB Drive	-	Y	Y	Y	-	-	Y	-	Y	Y
362532X	IBM RDX 320 GB External USB Drive	-	Y	Y	Y	-	-	Y	-	Y	Y
362550X// 1107	IBM RDX 500 GB External USB Drive	-	Y	Y	Y	-	-	Y	Y	Y	Y
81Y3645	IBM RDX 750GB Catridge	-	Y	Y	Y	-	-	-	-	Y	Y

Notes:

1. HS12 Machine Type 8014 only
2. For E5500 series processors only
3. Contains ESXi 4.0

Table 60: Server Drive Compatibility – Table 4

Option Part Number / Feature Code for x / Feature Code for p	Drives	JS12	JS22	JS23	JS43	PS700	PS701/702	PS703/704	PN41	QS21	QS22
	Other										
26K5777	73GB 10K SFF SAS NHS	Y	Y	Y	Y	-	-	-	-	-	-
42D0421	146GB SAS 10K SFF NHS	Y	Y	Y	Y	-	-	-	-	-	-
42D0627//8274	300GB 10K 6Gbps SAS 2.5" SFF NHS HDD	Y	Y	Y	Y	Y	Y	Y	-	-	-
49Y7427//8276	600GB 10K 6Gbps SAS 2.5" NHS HDD	-	-	Y	Y	Y	Y	Y	-	-	-
	IBM RDX Removable Hard Disk Storage System										
362516X// 1106	IBM RDX 160 GB External USB Drive	-	-	-	-	Y ¹	Y ¹	Y ¹	-	-	-
362532X	IBM RDX 320 GB External USB Drive	-	-	-	-	Y ¹	Y ¹	Y ¹	-	-	-
362550X// 1107	IBM RDX 500 GB External USB Drive	-	-	-	-	Y ¹	Y ¹	Y ¹	-	-	-
81Y3645	IBM RDX 750GB Catridge	-	-	-	-	Y ¹	Y ¹	Y ¹	-	-	-
81Y3647//EU01	IBM RDX 1TB Catridge	-	-	-	-	Y ¹	Y ¹	Y ¹	-	-	-

Notes:

- Requires 7216 – 1U2 Removable Media Device Drawer and FC 1103 RDX USB 2.0 docking station. VIOS and IBMi are not supported

Chassis Drive Compatibility

Table 61: Chassis Drive Compatibility

Option Part Number / Feature Code for x / Feature Code for p	Drives	BC-S chassis with SAS Connectivity Module	BC-S chassis with RAID Controller Module	BC-E chassis	BC-H chassis
22P7196	Portable 40GB USB 2.0 Hard Drive	Y	Y	-	-
362516X	RDX Removable Hard Disk Storage System – External USB 160 GB Bundle	Y	Y	-	-
362532X	RDX Removable Hard Disk Storage System – External USB 320 GB Bundle	Y	Y	-	-
362550X	RDX Removable Hard Disk Storage System – External USB 500 GB Bundle	Y	Y	-	-
39M4558	500GB 3.5" Dual Port Hot-Swap SATA II	Y	-	-	-
42D0519	450GB 15K SAS	Y	Y	-	-
42D0546	750GB 7200 NL SAS HS 3.5" HDD	Y	Y	-	-
42D0547	1 TB 7200 NL SAS HS 3.5" HDD	Y	Y	-	-
43W7524	146GB 15K 3.5" Hot-Swap SAS	Y	Y	-	-
42D0767	2 TB 7200 NL SAS HS 3.5" HDD	Y	Y	-	-
42D0777	1 TB 7200 NL SAS HS 3.5" HDD	Y	Y	-	-
43W7523	73GB 15K 3.5" Hot-Swap SAS	Y	Y	-	-
43W7580	750GB Hot-Swap SATA Dual Port	Y	-	-	-
43W7630	1000GB Hot Swap Dual Port SATA	Y	-	-	-
43X0802	300GB 15K 3.5" Hot-Swap SAS	Y	Y	-	-
44W2234	300GB15K 6Gbps SAS 3.5" Hot-Swap HDD	Y	Y	-	-
44W2239	450GB15K 6Gbps SAS 3.5" Hot-Swap HDD	Y	Y	-	-
44W2244	600GB15K 6Gbps SAS 3.5" Hot-Swap HDD	Y	Y	-	-
46C5364	RDX Removable Hard Disk Storage System – Internal USB 160GB Bundle	Y	-	-	-
46C5387	RDX Removable Hard Disk Storage System – Internal USB 320GB Bundle	Y	-	-	-
46C5388	RDX Removable Hard Disk Storage System – Internal USB 500GB Bundle	Y	-	-	-
46M0901	UltraSlim Enhanced SATA DVD-ROM	Y	Y	Y	-
46M0902	UltraSlim Enhanced SATA Multi-Burner	Y	Y	Y	Y

Memory

Table 62: Memory - Table 1

Option Part Number	Memory	HX5 MT=7872 ³	HS12	HS21	HS21XM	HS22		HS22V	
						5500	5600	5500	5600
39M5782	1GB Kit (2x 512MB DIMM) PC2 5300 DDR2 FBD CL4	-	-	Y	Y	-	-	-	-
39M5861	1GB (2x512MB) PC2-5300 CL5 ECC DDR2 VLP RDIMM	-	Y	-	-	-	-	-	-
39M5864	2GB (2x1GB) PC2-5300 CL5 ECC DDR2 VLP RDIMM	-	Y	-	-	-	-	-	-
41Y2825	2GB (2x1GB Kit) PC2-5300 CL5 DDR2 667 DIMM	-	-	-	-	-	-	-	-
41Y2828	4GB (2x 2GB Kit) PC2-5300 CL5 DDR2 667 DIMM	-	-	-	-	-	-	-	-
42C1600	IBM BladeCenter Memory and I/O Blade	-	-	Y	-	-	-	-	-
44T1485	1GB 1Rx8 1Gbit PC3-10600R-999, VLP RDIMM	-	-	-	-	Y	-	Y	-
44T1486	2GB DDR3-1333 2Rx8 VLP RDIMM	Y ²	-	-	-	Y	-	Y	-
44T1487	2GB 1Rx4 1Gbit PC3-10600R-999, VLP RDIMM	-	-	-	-	Y	-	Y	-
44T1488	4GB 2Rx4 1Gbit PC3-10600R-999, VLP RDIMM	-	-	-	-	Y	-	Y	-
44T1579	8GB PC3-8500 CL7 ECC DDR3 1066MHz Chipkill VLP RDIMM	-	-	-	-	Y	-	Y	-
44T1596	4GB DDR3-1333 2Rx8 VLP RDIMM	Y	-	-	-	Y	Y	Y	Y
46C7451	8GB PC3-10600 CL9 ECC DDR3 1333MHz Chipkill VLP RDIMM	-	-	-	-	Y	-	Y	-
44T1547 ¹	16GB (2x8GB)	-	-	-	-	-	-	-	-
46C0501	2GB (2x1GB) PC2-6400 CL6 ECC DDR2 VLP RDIMM	-	-	-	-	-	-	-	-
46C0509	4GB (2x2GB) 800MHz VLP PC2-6400 DDR2 Memory Kit	-	-	-	-	-	-	-	-
46C0510	8GB (2x4GB) PC2-6400 CL6 ECC DDR2 VLP RDIMM	-	-	-	-	-	-	-	-
46C0511	16GB (2x8GB kit) PC2-4200 CL4 ECC DDR2 VLP RDIMM	-	-	-	-	-	-	-	-
46C0512	4GB (2x2GB) PC2-5300 CL5 ECC DDR2 667 Single Rank VLP RDIMM	-	Y	-	-	-	-	-	-
46C0513	8GB (2x4GB) PC2-5300 CL5 ECC DDR2 667 Dual Rank VLP RDIMM	-	Y	-	-	-	-	-	-
46C0522	2GB (2 x 1GB) PC2-5300 CL5 ECC DDR2 667MHz VLP	-	-	-	-	-	-	-	-
46C0512	4GB (2 x 2GB) PC2-5300 CL5 ECC DDR2 667MHz VLP	-	-	-	-	-	-	-	-
46C0561	2GB 1R PC3L-10600R CL9, VLP RDIMM 1333MHz (1.35v)	-	-	-	-	-	Y	-	Y
46C0567	4GB 2R PC3L-10600R CL9, VLP RDIMM 1333MHz (1.35v)	-	-	-	-	-	Y	-	Y
46C0569	8GB 2R PC3L-8500R CL7, VLP RDIMM 1066MHz (1.35v)	-	-	-	-	-	Y	-	Y
46C7418	2GB (2x1GB) Single Rank PC2-5300 CL5 ECC FBD 667MHz Low Power Memory	-	-	Y	Y	-	-	-	-
46C7419	4GB (2x2GB) Dual Rank PC2-5300 CL5 ECC FBD 667MHz Low Power Memory	-	-	Y	Y	-	-	-	-
46C7420	8GB (2x4GB) Quad Rank PC2-5300 CL5 ECC FBD 667MHz Low Power Memory	-	-	Y	Y	-	-	-	-
46C7499	8GB DDR3-1066 4Rx8 VLP RDIMM	Y	-	-	-	-	-	-	-
46C7524	8GB (2 x 4GB) PC2-5300 CL5 ECC DDR2 667MHz VLP	-	-	-	-	-	-	-	-
46C7525	8GB (2 x 4GB) PC2-6400 CL5 ECC DDR2 800MHz VLP	-	-	-	-	-	-	-	-
46C7577	16GB (2x8GB) PC2-5300 CL5 ECC DDR2 667 FBDIMM AMB+	-	-	Y	Y	-	-	-	-

Notes:

1. This memory will operate at 533MHz in the LS22 and LS42
2. 2GB memory not supported on MAX5
3. All DIMM slots must be populated for optimal performance

Table 63: Memory - Table 2

Option Part Number	Memory	LS22	LS42	JS12	JS22	JS23	JS43	PS700	PS701	PS702	PN41	QS21	QS22 ²
39M5782	1GB Kit (2x 512MB DIMM) PC2 5300 DDR2 FBD CL4	-	-	-	-	-	-	-	-	-	-	-	-
39M5861	1GB (2x512MB) PC2-5300 CL5 ECC DDR2 VLP RDIMM	-	-	-	-	-	-	-	-	-	-	Y ¹	-
39M5864	2GB (2x1GB) PC2-5300 CL5 ECC DDR2 VLP RDIMM	-	-	-	-	-	-	-	-	-	-	-	-
41Y2825	2GB (2x1GB Kit) PC2-5300 CL5 DDR2 667 DIMM	-	-	-	-	-	-	-	-	-	-	-	-
41Y2828	4GB (2x 2GB Kit) PC2-5300 CL5 DDR2 667 DIMM	-	-	-	-	-	-	-	-	-	-	-	-
42C1600	IBM BladeCenter Memory and I/O Blade	-	-	-	-	-	-	-	-	-	-	-	-
44T1485	1GB 1Rx8 1Gbit PC3-10600R-999, VLP RDIMM	-	-	-	-	-	-	-	-	-	-	-	-
44T1486	2GB DDR3-1333 2Rx8 VLP RDIMM	-	-	-	-	-	-	-	-	-	-	-	-
44T1487	2GB 1Rx4 1Gbit PC3-10600R-999, VLP RDIMM	-	-	-	-	-	-	-	-	-	-	-	-
44T1488	4GB 2Rx4 1Gbit PC3-10600R-999, VLP RDIMM	-	-	-	-	-	-	-	-	-	-	-	-
44T1579	8GB PC3-8500 CL7 ECC DDR3 1066MHz Chipkill VLP RDIMM	-	-	-	-	-	-	-	-	-	-	-	-
44T1596	4GB DDR3-1333 2Rx8 VLP RDIMM	-	-	-	-	-	-	-	-	-	-	-	-
46C7451	8GB PC3-10600 CL9 ECC DDR3 1333MHz Chipkill VLP RDIMM	-	-	-	-	-	-	-	-	-	-	-	-
44T1547 ³	16GB (2x8GB)	Y	Y	-	-	-	-	-	-	-	-	-	-
46C0501	2GB (2x1GB) PC2-6400 CL6 ECC DDR2 VLP RDIMM	-	-	-	-	-	-	-	-	-	-	-	Y
46C0509	4GB (2x2GB) 800MHz VLP PC2-6400 DDR2 Memory Kit	-	-	-	-	-	-	-	-	-	-	-	Y
46C0510	8GB (2x4GB) PC2-6400 CL6 ECC DDR2 VLP RDIMM	-	-	-	-	-	-	-	-	-	-	-	Y
46C0511	16GB (2x8GB kit) PC2-4200 CL4 ECC DDR2 VLP RDIMM	-	-	-	-	-	-	-	-	-	-	-	-
46C0512	4GB (2x2GB) PC2-5300 CL5 ECC DDR2 667 Single Rank VLP RDIMM	-	-	-	-	-	-	-	-	-	-	-	-
46C0513	8GB (2x4GB) PC2-5300 CL5 ECC DDR2 667 Dual Rank VLP RDIMM	-	-	-	-	-	-	-	-	-	-	-	-
46C0522	2GB (2 x 1GB) PC2-5300 CL5 ECC DDR2 667MHz VLP	Y	Y	-	-	-	-	-	-	-	-	-	-
46C0512	4GB (2 x 2GB) PC2-5300 CL5 ECC DDR2 667MHz VLP	Y	Y	-	-	-	-	-	-	-	-	-	-
46C0561	2GB 1R PC3L-10600R CL9, VLP RDIMM 1333MHz (1.35v)	-	-	-	-	-	-	-	-	-	-	-	-
46C0567	4GB 2R PC3L-10600R CL9, VLP RDIMM 1333MHz (1.35v)	-	-	-	-	-	-	-	-	-	-	-	-
46C0569	8GB 2R PC3L-8500R CL7, VLP RDIMM 1066MHz (1.35v)	-	-	-	-	-	-	-	-	-	-	-	-
46C7418	2GB (2x1GB) Single Rank PC2-5300 CL5 ECC FBD 667MHz Low Power Memory	-	-	-	-	-	-	-	-	-	-	-	-
46C7419	4GB (2x2GB) Dual Rank PC2-5300 CL5 ECC FBD 667MHz Low Power Memory	-	-	-	-	-	-	-	-	-	-	-	-
46C7420	8GB (2x4GB) Quad Rank PC2-5300 CL5 ECC FBD 667MHz Low Power Memory	-	-	-	-	-	-	-	-	-	-	-	-
46C7499	8GB DDR3-1066 4Rx8 VLP RDIMM	-	-	-	-	-	-	-	-	-	-	-	-
46C7524	8GB (2 x 4GB) PC2-5300 CL5 ECC DDR2 667MHz VLP	Y	Y	-	-	-	-	-	-	-	-	-	-
46C7525	8GB (2 x 4GB) PC2-6400 CL5 ECC DDR2 800MHz VLP	Y	Y	-	-	-	-	-	-	-	-	-	-
46C7577	16GB (2x8GB) PC2-5300 CL5 ECC DDR2 667 FBDIMM AMB+	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

- Optional as I/O buffer memory only
- Total processor memory on IBM BladeCenter QS22 is variable from 4-32 GB. Memory DIMMs are 1GB, 2GB, and 4GB in size and must be installed in sets of 4 up to a total of 8 DIMMs per QS22. Highest memory bandwidth and optimal performance can be achieved when all eight memory DIMM sockets are populated. It is recommended that option memory be added such that all memory DIMM sockets are used.
- This memory will operate at 533MHz in the LS22 and LS42

Table 64: Memory - Table 3

Option Part Number / Feature Code for x / Feature Code for p	Memory	HX5 ¹		HS12	HS21	HS21XM	HS22		HS22V		HS23	HS23E
		7872	7873				5500	5600	5500	5600		
49Y1427	1GB 1R PC3L-10600 CL9, VLP RDIMM 1333MHz	-	-	-	-	-	Y	Y	Y	Y	-	-
49Y1428	2GB 2R PC3L-10600 CL9, VLP RDIMM 1333MHz	-	-	-	-	-	Y	Y	Y	Y	-	-
49Y1429	2GB 1R PC3L-10600 CL9, VLP RDIMM 1333MHz	-	-	-	-	-	Y	Y	Y	Y	-	-
49Y1430	4GB 2R PC3L-10600 CL9, VLP RDIMM 1333MHz	-	-	-	-	-	Y	Y	Y	Y	-	-
49Y1431	8GB 2R PC3L-10600 CL9, VLP RDIMM 1333MHz	-	-	-	-	-	Y	Y	Y	Y	-	-
//8229	4GB(2X2GB) MEMORY, 667MHz VLP RDIMMS	-	-	-	-	-	-	-	-	-	-	-
//8239	8GB(2X4GB) MEMORY, 667 MHz VLP RDIMMS	-	-	-	-	-	-	-	-	-	-	-
//8245	16GB(2X8GB) MEMORY, 400MHz VLP RDIMMS	-	-	-	-	-	-	-	-	-	-	-
//8208	8GB(2X4GB), 1066MHz, DDR3, VLP DIMMS	-	-	-	-	-	-	-	-	-	-	-
//8209	16GB(2X8GB), 1066MHz, DDR3, VLP DIMMS	-	-	-	-	-	-	-	-	-	-	-
//8196	8GB(2X4GB), 1066MHz, DDR3, VLP RDIMMS	-	-	-	-	-	-	-	-	-	-	-
//8199	16GB(2X8GB), 1066MHz, DDR3, VLP RDIMMS	-	-	-	-	-	-	-	-	-	-	-
44T1594	2GB (1x2GB, 1Rx8, 1.5V) PC3-10600 CL9 ECC DDR3 1333MHz VLP RDIMM	-	-	-	-	-	Y	Y	Y	Y	-	-
46C0560	2GB (1x2GB, 1Rx8, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz VLP RDIMM	-	Y	-	-	-	Y	Y	Y	Y	Y	Y
46C0563	4GB (1x4GB, 1Rx4, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz VLP RDIMM	-	-	-	-	-	Y	Y	Y	Y	Y	Y
46C0564	4GB (1x4GB, 2Rx8, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz VLP RDIMM	-	Y	-	-	-	Y	Y	Y	Y	Y	Y
46C0568	8GB(2Rx4, 1.35V) DDR3 1333MHz VLP RDIMM	-	-	-	-	-	-	-	-	-	Y	Y
46C0570	8GB 4Rx8 2Gbit PC3L-8500R VLP RDIMM 1.35V Capable	-	Y	-	-	-	-	-	-	-	-	-
46C0599	16GB (1x16GB, 2Rx4, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz VLP RDIMM	-	Y	-	-	-	-	Y	-	Y	Y	Y
49Y1555	8GB (2Gb, 2Rx4, 1.5V) DDR3-1333 VLP RDIMM	Y	-	-	-	-	-	-	-	-	-	-
90Y3147	4GB(2Gb, 1Rx4, 1.5V) DDR3 1600MHz VLP RDIMM	-	-	-	-	-	-	-	-	-	Y	Y
90Y3148	4GB(2Gb, 2Rx8, 1.5V) DDR3 1600MHz VLP RDIMM	-	-	-	-	-	-	-	-	-	Y	Y
90Y3149	8GB(2Gb, 2Rx4, 1.5V) DDR3 1600MHz VLP RDIMM	-	-	-	-	-	-	-	-	-	Y	Y
90Y3221	16GB (2Gb,4Rx4,1.35V) PC3L-8500 DDR3-1066 Planar-X VLP RDIMM	-	Y ²	-	-	-	-	-	-	-	-	Y

Notes:

1. All DIMM slots must be populated for optimal performance
2. Not Supported on MAX5

Table 65: Memory - Table 4

Option Part Number / Feature Code for x / Feature Code for p	Memory	LS22	LS42	JS12	JS22	JS23	JS43	PS700	PS701/702	PS703/704	PN41	QS21	QS22 ¹
49Y1427	1GB 1R PC3L-10600 CL9, VLP RDIMM 1333MHz	-	-	-	-	-	-	-	-	-	-	-	-
49Y1428	2GB 2R PC3L-10600 CL9, VLP RDIMM 1333MHz	-	-	-	-	-	-	-	-	-	-	-	-
49Y1429	2GB 1R PC3L-10600 CL9, VLP RDIMM 1333MHz	-	-	-	-	-	-	-	-	-	-	-	-
49Y1430	4GB 2R PC3L-10600 CL9, VLP RDIMM 1333MHz	-	-	-	-	-	-	-	-	-	-	-	-
49Y1431	8GB 2R PC3L-10600 CL9, VLP RDIMM 1333MHz	-	-	-	-	-	-	-	-	-	-	-	-
//8229	4GB(2X2GB) MEMORY, 667MHz VLP RDIMMS	-	-	Y	-	-	-	-	-	-	-	-	-
//8239	8GB(2X4GB) MEMORY, 667 MHz VLP RDIMMS	-	-	Y	-	Y	Y	-	-	-	-	-	-
//8245	16GB(2X8GB) MEMORY, 400MHz VLP RDIMMS	-	-	Y	-	Y	Y	-	-	-	-	-	-
//8208	8GB(2X4GB), 1066MHz, DDR3, VLP DIMMS	-	-	-	-	-	-	Y	Y	-	-	-	-
//8209	16GB(2X8GB), 1066MHz, DDR3, VLP DIMMS	-	-	-	-	-	-	Y	Y	-	-	-	-
//8196	8GB(2X4GB), 1066MHz, DDR3, VLP RDIMMS	-	-	-	-	-	-	-	-	Y	-	-	-
//8199	16GB(2X8GB), 1066MHz, DDR3, VLP RDIMMS	-	-	-	-	-	-	-	-	Y	-	-	-
44T1594	2GB (1x2GB, 1Rx8, 1.5V) PC3-10600 CL9 ECC DDR3 1333MHz VLP RDIMM	-	-	-	-	-	-	-	-	-	-	-	-
46C0560	2GB (1x2GB, 1Rx8, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz VLP RDIMM	-	-	-	-	-	-	-	-	-	-	-	-
46C0563	4GB (1x4GB, 1Rx4, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz VLP RDIMM	-	-	-	-	-	-	-	-	-	-	-	-
46C0564	4GB (1x4GB, 2Rx8, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz VLP RDIMM	-	-	-	-	-	-	-	-	-	-	-	-
46C0599	16GB (1x16GB, 2Rx4, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz VLP RDIMM	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

1. Total processor memory on IBM BladeCenter QS22 is variable from 4-32 GB. Memory DIMMs are 1GB, 2GB, and 4GB in size and must be installed in sets of 4 up to a total of 8 DIMMs per QS22. Highest memory bandwidth and optimal performance can be achieved when all eight memory DIMM sockets are populated. It is recommended that option memory be added such that all memory DIMM sockets are used.

Shared Storage Subsystem and Storage Enclosures

Table 66: Shared Storage Subsystem and Storage Enclosures - Table 1

Part Number or MT-Model	Shared Storage Subsystem or Enclosure	HX5	HS12	HS21	HS21XM	HS22	HS22V	HS23	HS23E	LS22	LS42
172621X	IBM System Storage DS3200 Storage Controller - SAS Single Controller	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹
172622X	IBM System Storage DS3200 Storage Controller - SAS Dual Controller	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹
172631X	IBM System Storage DS3300 Storage Controller - iSCSI Single Controller	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹
172632X	IBM System Storage DS3300 Storage Controller-- iSCSI Dual Controller	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹
172641X	IBM System Storage DS3400 Storage Controller-- FC Single Controller	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹
172642X	IBM System Storage DS3400 Storage Controller-- FC Dual Controller	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹
172701X	IBM System Storage EXP3000 Expansion Unit	Y ²	Y ²	-	-	Y ²	Y ²	Y ²	Y ²	-	-
1746A2D	IBM System Storage DS3512 Express Dual Controller Storage System	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹
1746A2S	IBM System Storage DS3512 Express Single Controller Storage System	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹
1746A4D	IBM System Storage DS3524 Express Dual Controller Storage System	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹
1746A4S	IBM System Storage DS3524 Express Single Controller Storage System	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹
174712X	IBM System Storage EXP2512 Express	-	-	-	-	-	-	Y ¹	-	-	-
174724X	IBM System Storage EXP2524 Express	-	-	-	-	-	-	Y ¹	-	-	-
1750-511	IBM TotalStorage DS6800 1750 model 511	-	-	Y	Y	-	Y	-	-	-	-
18147xx	IBM System Storage DS4200 Midrange Disk System (all models)	-	-	-	-	-	-	-	Y	-	-
18149xx	IBM System Storage DS3950 Express	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹
1814-20A	IBM System Storage DS5020 Midrange Disk System	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹
18158xx	IBM System Storage DS4800 Midrange Disk System (all models)	-	-	-	-	-	-	-	Y	-	-
1818-51A	IBM System Storage DS5100 Midrange Disk System	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹
1818-53A	IBM System Storage DS5300 Midrange Disk System	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹

Notes:

- DS3000 and DS5000 storage system support on a given blade will vary by attachment type (FC, iSCSI, SAS), operating system, and storage controller firmware level. Refer to the IBM System Storage Interoperation Center (SSIC) for up-to-date and comprehensive interoperability information: <http://www.ibm.com/systems/support/storage/config/ssic>
- The IBM System Storage EXP3000 Expansion Unit is supported for direct connection to selected BladeCenter systems using the ServeRAID-MR10ie (CIOv) Controller for IBM BladeCenter w/Battery CIO (PN 46C7167). The EXP3000 is compatible with all BladeCenter systems and operating systems supported by the ServeRAID-MR10ie controller. The EXP3000 is only supported with the SAS Connectivity Module (39Y9195/ 3267) and is not supported with the BC-S SAS RAID Controller Module (43W3584 / 3734).

Table 67: Shared Storage Subsystem and Storage Enclosures - Table 2

Part Number or MT-Model	Shared Storage Subsystem or Enclosure	JS12	JS22	JS23	JS43	PS700	PS701/702	PS703/704	PN41	QS21	QS22
172621X	IBM System Storage DS3200 Storage Controller - SAS Single Controller	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	-	-	-
172622X	IBM System Storage DS3200 Storage Controller - SAS Dual Controller	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	-	-	-
172631X	IBM System Storage DS3300 Storage Controller - iSCSI Single Controller	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	-	-	-
172632X	IBM System Storage DS3300 Storage Controller - iSCSI Dual Controller	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	-	-	-
172641X	IBM System Storage DS3400 Storage Controller - FC Single Controller	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	-	-	-
172642X	IBM System Storage DS3400 Storage Controller - FC Dual Controller	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	-	-	-
1746A2D	IBM System Storage DS3512 Express Dual Controller Storage System	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ²	-	-	-
1746A2S	IBM System Storage DS3512 Express Single Controller Storage System	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ²	-	-	-
1746A4D	IBM System Storage DS3524 Express Dual Controller Storage System	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ²	-	-	-
1746A4S	IBM System Storage DS3524 Express Single Controller Storage System	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ²	-	-	-
18149xx	IBM System Storage DS3950 Express	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	-	-	-
1814-20A	IBM System Storage DS5020 Midrange Disk System	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	-	-	-
1818-51A	IBM System Storage DS5100 Midrange Disk System	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	-	-	-
1818-53A	IBM System Storage DS5300 Midrange Disk System	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	-	-	-

Notes:

- DS3000 and DS5000 storage system support on a given blade will vary by attachment type (FC, iSCSI, SAS), operating system, and storage controller firmware level. Refer to the IBM System Storage Interoperation Center (SSIC) for up-to-date and comprehensive interoperability information: <http://www.ibm.com/systems/support/storage/config/ssic>
- VIOS and VSCSI is planned to be supported in 3Q 2011. Otherwise, refer to the IBM System Storage Interoperation Center (SSIC) for up-to-date and comprehensive interoperability information: <http://www.ibm.com/systems/support/storage/config/ssic>

Table 68: Shared Storage Subsystem and Storage Enclosures - Table 3

Part Number	Shared Storage Subsystem or Enclosure ^{1, 2}	HX5	HS12	HS21	HS21XM	HS22	HS22V	HS23	HS23E	LS22	LS42
2107-92E/9AE	IBM TotalStorage DS8000 Expansion Unit 2107 model 92E/9AE	Y	-	Y	Y	Y	Y	Y	Y	Y	Y
2107-xxx	IBM TotalStorage DS8100 2107 (all models)	Y	-	Y	Y	Y	Y	Y	Y	Y	Y
2107-xxx	IBM TotalStorage DS8300 2107(all models)	Y	-	Y	Y	Y	Y	Y	Y	Y	Y
2412-xxx	IBM System Storage DS8700 2412 (all models)	-	-	-	-	-	-	-	Y	-	-
242x-95x	IBM System Sotrage DS8800 242x (all models)	-	-	-	-	-	-	-	Y	-	-
2145 v5.1.x	IBM SAN Volume Controller version 5.1.x	Y	-	-	-	-	Y	-	-	-	-
2145 v6.1.x	IBM SAN Volume Controller version 6.1.x	Y	-	-	-	-	Y	-	-	-	-
2145 v6.2.x	IBM SAN Volume Controller version 6.2.x	Y	-	-	-	-	Y	Y	Y	-	-
2076 v6.1.x	IBM Storwize V7000 6.1.x	Y	-	-	-	-	Y	-	-	-	-
2076 v6.2	IBM Storwize V7000 6.2.x	Y	-	-	-	-	Y	Y	Y	-	-
2812-A14	IBM XIV Storage System Model A14	-	-	-	-	-	-	Y	Y	-	-
281x-114	IBM XIV Storage System Gen 3 (MT 281x) Model 114	-	-	-	-	-	-	Y	Y	-	-
2858-A10, A20	IBM System Storage N6040 model A10/A20 and Gateway feature	-	-	Y	Y	Y	Y	Y	Y	Y	Y
2858-A11, A21	IBM System Storage N6070 model A11/A21 and Gateway feature	-	-	Y	Y	Y	Y	Y	Y	Y	Y
2858-A12, A22	IBM System Storage N6060 model A12/A22 and Gateway feature	-	-	Y	Y	Y	Y	Y	Y	Y	Y
2858-C10, C20	IBM System Storage N6210 model C10/C201 and Gateway feature	-	-	-	-	-	-	-	Y	-	-
2858-E11,C21,E21	IBM System Storage N6240 model E11/C21/E21 and Gateway feature	-	-	-	-	-	-	-	Y	-	-
2858-E12, C22, E22	IBM System Storage N6270 model E12/C22/E22 and Gateway feature	-	-	-	-	-	-	-	Y	-	-
2859-A10, A20	IBM System Storage N3300 model A10/A20	-	-	Y	Y	Y	Y	Y	Y	Y	Y
2859-A11/ A21, G11/G21	IBM System Storage N3400 model A11/A21 G11/G21	-	-	-	-	-	-	-	Y	-	-
2862-A10, A20	IBM System Storage N3600 model A10/A20	-	-	Y	Y	Y	Y	Y	Y	Y	Y
2863-A10, A20	IBM System Storage N3700 model A10, A20	-	-	Y	-	Y	Y	-	-	Y	Y
2864-A10,A20,G10,G20	IBM System Storage N5200 model A10, A20, G10, G20	-	-	Y	Y	Y	Y	-	-	Y	Y
2865-A10,A20,G10,G20	IBM System Storage N5500 model A10, A20, G10, G20	-	-	Y	Y	Y	Y	-	-	Y	Y
2866-A10,A20,G10,G20	IBM System Storage N7600 model A10, A20, G10, G20	-	-	Y	Y	Y	Y	Y	Y	Y	-
2866-A11,A21,G11,G21	IBM System Storage N7700 model A11, A21, G11, G21	-	-	Y	Y	Y	Y	Y	Y	Y	Y
2867-A10,A20,G10,G20	IBM System Storage N7800 model A10, A20, G10, G20	-	-	Y	Y	Y	Y	Y	Y	-	-
2867-A11,A21,G11,G21	IBM System Storage N7900 model A11, A21, G11, G21	-	-	Y	Y	Y	Y	Y	Y	Y	Y
2867-E22	IBM System Storage N7950T model E22 and Gateway	-	-	-	-	-	-	Y	Y	-	-
2868-A10,A20,G10,G20	IBM System Storage N5600 model A10, A20, G10, G20	-	-	-	Y	Y	Y	Y	Y	Y	Y
2869-A10,A20,G10,G20	IBM System Storage N5300 model A10, A20, G10, G20	-	-	-	Y	Y	Y	Y	Y	Y	Y
9406-xxx	IBM System i (all models) Integration with BladeCenter and System x	-	-	Y	Y	Y	Y	Y	Y	Y	Y

Notes:

- For N series models, see the IBM N series interoperability matrix at www.ibm.com/systems/storage/network/interophome.html.
- The IBM N series support web site is at: www.ibm.com/storage/support/nseries

Table 69: Shared Storage Subsystem and Storage Enclosures - Table 4

Part Number	Shared Storage Subsystem or Enclosure ^{1, 2}	JS12	JS22	JS23	JS43	PS700	PS701/702	PS703/704	PN41	QS21	QS22
2107-92E/9AE	IBM TotalStorage DS8000 Expansion Unit 2107 model 92E/9AE	Y	Y	Y	Y	Y	Y	Y	-	-	-
2107-xxx	IBM TotalStorage DS8100 2107 (all models)	Y	Y	Y	Y	Y	Y	Y	-	-	-
2107-xxx	IBM TotalStorage DS8300 2107(all models)	Y	Y	Y	Y	Y	Y	Y	-	-	-
2412-xxx	IBM System Storage DS8700 2412 (all models)	Y	Y	-	Y	Y	Y	Y	-	-	-
2145 v5.1.x	IBM SAN Volume Controller version 5.1.x	Y	Y	Y	Y	Y	Y	Y	-	-	-
2145 v6.1.x	IBM SAN Volume Controller version 6.1.x	Y	Y	Y	Y	Y	Y	Y			
2145 v6.2.x	IBM SAN Volume Controller version 6.2.x	Y	Y	Y	Y	Y	Y	Y			
2076 v6.1.x	IBM Storwize V7000 6.1.x	Y	Y	Y	Y	Y	Y	Y			
2076 v6.2	IBM Storwize V7000 6.2.x	Y	Y	Y	Y	Y	Y	Y			
2812-A14	IBM XIV Storage System Model A14	Y	Y	Y	Y	Y	Y	Y	-	-	-
2858-A10, A20	IBM System Storage N6040 model A10/A20 and Gateway feature	Y	Y	Y	Y	Y	Y	Y	-	-	-
2858-A11, A21	IBM System Storage N6070 model A11/A21 and Gateway feature	Y	Y	Y	Y	Y	Y	Y	-	-	-
2858-A12, A22	IBM System Storage N6060 model A12/A22 and Gateway feature	Y	Y	Y	Y	Y	Y	Y	-	-	-
2859-A10, A20	IBM System Storage N3300 model A10/A20	Y	Y	Y	Y	Y	Y	Y	-	-	-
2859-A11/ A21, G11/G21	IBM System Storage N3400 model A11/A21 G11/G21	Y	Y	Y	Y	Y	Y	Y	-	-	-
2862-A10, A20	IBM System Storage N3600 model A10/A20	Y	Y	Y	Y	Y	Y	Y	-	-	-
2863-A10, A20	IBM System Storage N3700 model A10, A20	Y	Y	Y	Y	Y	Y	Y	-	-	-
2864-A10,A20,G10,G20	IBM System Storage N5200 model A10, A20, G10, G20	Y	Y	Y	Y	Y	Y	Y	-	-	-
2865-A10,A20,G10,G20	IBM System Storage N5500 model A10, A20, G10, G20	Y	Y	Y	Y	Y	Y	Y	-	-	-
2866-A10,A20,G10,G20	IBM System Storage N7600 model A10, A20, G10, G20	-	Y	Y	Y	Y	Y	Y	-	-	-
2866-A11,A21,G11,G21	IBM System Storage N7700 model A11, A21, G11, G21	Y	Y	Y	Y	Y	Y	Y	-	-	-
2867-A10,A20,G10,G20	IBM System Storage N7800 model A10, A20, G10, G20	-	Y	Y	Y	Y	Y	Y	-	-	-
2867-A11,A21,G11,G21	IBM System Storage N7900 model A11, A21, G11, G21	Y	Y	Y	Y	Y	Y	Y	-	-	-
2868-A10,A20,G10,G20	IBM System Storage N5600 model A10, A20, G10, G20	Y	Y	Y	Y	Y	Y	Y	-	-	-
2869-A10,A20,G10,G20	IBM System Storage N5300 model A10, A20, G10, G20	Y	Y	Y	Y	Y	Y	Y	-	-	-
9406-xxx	IBM System i (all models) Integration with BladeCenter and System x	-	-	-	-	-	-	-	-	-	-

Notes:

1. For N series models, see the IBM N series interoperability matrix at www.ibm.com/systems/storage/network/interophome.html.
2. The IBM N series support web site is at: www.ibm.com/storage/support/nseries

Software

BladeCenter Open Fabric Manager¹ Compatibility

Table 70: BladeCenter Open Fabric Manager Compatibility – Table 1

M/T or Part Number	Description	BOFM Basic (44W3981 = 2019B1X)	BOFM 2.1 Advanced Upgrade (46C3551, stand alone)	BOFM 3.0/3.1 Advanced Upgrade (4812S3X, stand alone)	BOFM 4.0/4.1 Advanced Upgrade (4812S3X, stand alone)	BOFM Advanced 2.1 Upgrade for IBM Director (46C3552, plug-in)	BOFM Advanced 3.0/3.1 Upgrade for IBM Director (4812S3D, plug-in)	BOFM Advanced 3.2 Upgrade for IBM Director (4812S3D, plug-in)
Chassis								
8677	IBM BladeCenter E	Y	Y	Y	Y	Y	Y	Y
8852	IBM BladeCenter H	Y	Y	Y	Y	Y	Y	Y
8740, 8750	BladeCenter HT	Y	Y	Y	Y	Y	Y	Y
8720, 8730	BladeCenter T	Y	Y	Y	Y	Y	Y	Y
8886	BladeCenter S	Y	Y	Y	Y	Y	Y	Y
Blades Servers								
7872, 7873	HX5	Y	-	-	Y ³	-	-	-
80,148,028	HS12	Y	Y	Y	Y	Y	Y	Y
8853	HS21	Y	Y	Y	Y	Y	Y	Y
7995	HS21 XM	Y	Y	Y	Y	Y	Y	Y
7870	HS22	Y	-	Y	Y	-	Y	Y
7871	HS22V	Y	-	Y	Y	-	Y	Y
7875	HS23	Y	-	Y	Y	-	Y	Y
8038	HS23E	Y	Y	Y	Y	Y	Y	Y
7901	LS22	Y	Y	Y	Y	Y	Y	Y
7902	LS42	Y	-	-	Y	-	-	-
7998-60x	JS12	Y ²	Y ²	Y ²	Y ²	Y ²	Y ²	Y ²
7998-61x	JS22	Y ²	Y ²	Y ²	Y ²	Y ²	Y ²	Y ²
7778-23x	JS23	Y ²	Y ²	Y ²	Y ²	Y ²	Y ²	Y ²
7778-23x	JS43	Y ²	-	-	Y ²	-	-	-
8406-70Y/71Y	PS700/701	Y ²	-	Y ²	Y ²	-	Y ²	Y ²
8406-70Y/71Y	PS702	Y	-	-	Y	-	-	-
7891-73X	PS703	Y ²	-	Y ²	Y ²	-	Y ²	Y ²
7891-74X	PS704	Y	-	-	Y	-	-	-
792	QS21	-	-	-	-	-	-	-
793	QS22	-	-	-	-	-	-	-

Notes:

- Reflects single instance compatibility.
- BOFM is not supported for SAS adapters on JSxx or PSxxx blades. BOFM management of Fibre Channel (FC) boot targets is not supported JSxx or PSxxx blades. When configuring a code spare, FC targets can be pre-assigned in the boot list using SMS menus. BOFM Advanced upgrades are not applications installed on the JSxx or PSxxx blade.

- Advanced BOFM v4.0 and later supports single node and non partitioned double node HX5 blades. Advanced BOFM does not support double node partitioned HX5 blades.

Table 71: BladeCenter Open Fabric Manager Compatibility – Table 2

M/T or Part Number	Description	BOFM Basic (44W3981 = 2019B1X)	BOFM 2.1 Advanced Upgrade (46C3551, stand alone)	BOFM 3.0 Advanced Upgrade (4812S3X, stand alone)	BOFM Advanced 2.1 Upgrade for IBM Director (46C3552, plug-in)	BOFM Advanced 3.0 Upgrade for IBM Director (4812S1D, plug-in)
Expansion Cards						
26R0884	QLogic 4Gb Standard Fibre Channel Expansion Card	Y	Y	Y	Y	Y
26R0890	QLogic 4 Gb SFF Fibre Channel Expansion Card	Y	Y	Y	Y	Y
39R8624	IBM SFF Gb Ethernet Expansion Card	Y	Y	Y	Y	Y
39Y9186	Emulex 4 Gb SFF Fibre Channel Expansion Card	Y	Y	Y	Y	Y
39Y9190	SAS Expansion Card for IBM BladeCenter (CFFv)	Y	-	Y	-	Y
39Y9306	QLogic Ethernet and 4 Gb Fibre Channel Expansion Card (CFFh)	Y	Y	Y	Y	Y
39Y9310	Ethernet Expansion Card (CFFv)	Y	Y	Y	Y	Y
41Y8527	QLogic 4 Gb Fibre Channel Expansion Card (CFFv)	Y	Y	Y	Y	Y
42C1830	QLogic 2-port 10Gb Converged Network Adapter (CFFh)	Y	-	Y	-	Y
43W3974	SAS Connectivity Card (CFFh)	Y	-	Y	-	Y
43W4068	SAS Connectivity Card (CIOv)	Y	-	Y	-	Y
43W6859	Emulex 4Gb Fibre Channel Expansion Card (CFFv)	Y	Y	Y	Y	Y
44W4465	Broadcom 10Gb 4-port Ethernet Exp Card (CFFh)	Y ²	Y ²	Y ²	Y ²	Y ²
44W4466	Broadcom 10Gb 2-port Ethernet Exp Card (CFFh)	Y ²	Y ²	Y ²	Y ²	Y ²
81Y3133	Broadcom 2-port 10Gb Virtual Fabric Adapter (CFFh)	Y	Y	Y	Y	Y
44W4475	Ethernet Expansion Card (CIOv)	Y	Y	Y	Y	Y
44W4479	2/4 Port Ethernet Expansion Card (CFFh)	Y	Y	Y	Y	Y
44X1940	QLogic Ethernet and 8 Gb Fibre Channel Expansion Card (CFFh)	Y	Y	Y	Y	Y
44X1945	QLogic 8Gb Fibre Channel Expansion Card (CIOv)	Y	-	Y	-	Y
46M6065	QLogic 4 Gb Fibre Channel Expansion Card (CIOv)	Y	Y	Y	Y	Y
46M6140	Emulex 8Gb Fibre Channel Expansion Card (CIOv)	Y	-	Y	-	Y
90Y3570	Mellanox 2-port 10Gb Ethernet Expansion Card (CFFh)	Y	Y	Y	Y	Y

Notes:

- Reflects single instance compatibility.
- This card does not support MCAD/Auto Discovery with any combination of blade or switch

Table 72: BladeCenter Open Fabric Manager Compatibility – Table 3

M/T or Part Number	Description	BOFM Basic (44W3981 = 2019B1X)	BOFM 2.1 Advanced Upgrade (46C3551, stand alone)	BOFM 3.0/3.1 Advanced Upgrade (4812S3X, stand alone)	BOFM 4.0/4.1 Advanced Upgrade (4812S3X, stand alone)	BOFM Advanced 2.1 Upgrade for IBM Director (46C3552, plug-in)	BOFM Advanced 3.0/3.1 Upgrade for IBM Director (4812S3D, plug-in)	BOFM Advanced 3.2 Upgrade for IBM Director (4812S3D, plug-in)
42C1830	QLogic 2port CAN - Ethernet(MAC) and FCoE (NV_Port)	Y	-	-	Y ⁴	-	-	-
49Y4235/ 49Y4275	Emulex VFA - Ethernet(MAC); pNIC and vNIC VFA modes ¹	Y	-	-	Y ⁴	-	-	-
90Y3550/ 90Y3566	Emulex 10GbE VFA II - Ethernet(MAC); pNIC and vNIC VFA modes ¹	Y	-	-	Y ⁴	-	-	-
81Y3133	Broadcom 2port10Gb VFA II Ethernet(MAC) vNIC (switch independent mode) ²	-	-	-	-	-	-	-
90Y3550/ 90Y3566	Emulex 10GbE VFA II - Ethernet(MAC) and FCoE (NV_port) vNIC (switch independent mode) ³	-	-	-	-	-	-	-

Notes:

1. Emulex VFA vNIC VFA mode requires BNT 10port 10G Switch
2. Broadcom 2port10Gb VFA II Ethernet(MAC) vNIC (switch independent mode) requires Nexus4001I or Brocade Converged SW
3. Emulex 10GbE VFA II Ethernet(MAC) and FCoE (NV_Port) requires Brocade Converged SW
4. BOFM 4.1 Only

Blades & BladeBoot (iSCSI SW Boot) Compatibility

Provides iSCSI Communication

BladeBoot™ enables you to boot from a SAN over a standard Ethernet port using the iSCSI protocol. This allows for storage consolidation, efficiencies in storage utilization, simplified deployment, improved reliability, and simpler ecosystem management. No local disk is required to reside within the blade server.

Table 73: Blades & BladeBoot (iSCSI SW Boot) Compatibility

Blade Servers	Windows Server 2003	Windows Server 2008	SLES10 SP1	RHEL 51	SLES10 SP4	SLES11 SP2	RHEL 5.7	RHEL 6.2
HX5 (7872, 7873)	-	Y	Y	Y	-	-	-	-
HS12 (8014,8028)	Y	Y	Y	Y	-	-	-	-
HS21 Dual Core (8853)	Y	Y	Y	Y	-	-	-	-
HS21 Quad Core (8853)	Y	Y	Y	Y	-	-	-	-
HS21 XM Dual Core (7995)	Y	Y	Y	Y	-	-	-	-
HS21 XM Quad Core (7995)	Y	Y	Y	Y	-	-	-	-
HS22 (7870)	Y	Y	Y	Y	-	-	-	-
HS22V (7871)	Y	Y	Y	Y	-	-	-	-
HS23	-	Y	Y	Y	-	-	-	-
HS23E	-	Y	-	-	Y ²	Y ²	Y ²	Y ²
LS22	-	-	-	-	-	-	-	-
LS42	-	-	-	-	-	-	-	-
JS12 (7998-60X)	-	-	-	-	-	-	-	-
JS22 (7988; except 60X)	-	-	-	-	-	-	-	-
JS23/43 (7778-23x)	-	-	-	-	-	-	-	-
PS700, 701, 702, 703, 704	-	-	-	-	-	-	-	-
QS21 (0792)	-	-	-	-	-	-	-	-
QS22 (0793)	-	-	-	-	-	-	-	-

Notes:

1. RHEL 5 represents limited support, with full support targeted for RHEL 5.2
2. HS23E is not supported with Xen kernel Linux OS for iSCSI SW Boot.

Targets: IBM System Storage N series iSCSI Models and DS3300

Blades NOS Compatibility

Blades NOS Compatibility with specific version and service pack information can be found at:

<http://www.ibm.com/servers/eserver/serverproven/compat/us/nos/ematrix.shtml>

BladeCenter NOS Compatibility – Chassis

The BladeCenter S chassis supports VMware ESX 3.0, 3.5 & 4.0

Additional detail can be found at http://www.vmware.com/pdf/vi3_io_guide.pdf

Tools Compatibility

Table 74: Tools Compatibility

Tool Name	HX5	HS12	HS21	HS21XM	HS22	HS22V	HS23	HS23E	LS22	LS42	JS12	JS22	JS23	JS43	PS700	PS701/702	PS703/704	PN41	QS21	QS22
Microsoft Windows Preinstallation Environment 2.1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-	-	-	-
IBM Director	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	-	Y	Y
Remote Deployment Manager	-	Y	Y	Y	-	-	-	-	Y	Y	-	-	-	-	-	-	-	-	Y	-
Tivoli Provisioning Manager for OS Deployment	Y	-	-	-	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-	-	-	Y
IBM Dynamic System Analysis Preboot 9.0	Y	Y	Y	Y	Y	Y	Y	Y ²	Y	Y	-	-	-	-	-	-	-	-	-	-
IBM Dynamic System Analysis Online 9.0	Y	Y	Y	Y	Y	Y	Y	Y ²	Y	Y	-	-	-	-	-	-	-	-	-	-
Active Energy Manager	Y	Y	Y	Y	Y	Y	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	-	Y	Y
Power Configurator	Y	-	Y	Y	Y	Y	-	Y	Y	Y	-	Y	-	-	Y	Y	Y	-	Y	Y
IBM UpdateXpress System Pack Installer 9.0	Y	Y	Y	Y	Y	Y	Y	Y ²	Y	Y	-	-	-	-	-	-	-	-	-	-

Notes:

1. See ServerProven for specific version information

Telco/NEBs Compliance

Telco Blades to Telco Chassis Interoperability

This table provides guidance on blade servers that have been tested for NEBS Level 3 and ETSI compliance for use in a central office environment. The vendor CPU identifiers are listed for each blade server type (AMD, Cell, Intel, Power)

Table 75: Telco Blades to Telco Chassis Interoperability

NEBS-Compliant Blade Servers	T NEBS3/ETSI	HT NEBS3/ETSI
HX5 (7872, 7873)	-	-
HS12 (8014,8028)	-	-
HS21 Dual Core (8853)	5138 (35W)	5138 (35W) 5140 (65W)
HS21 Quad Core (8853)	L5408 (40W)	E5345 (80W) E5440 (80W) L5408 (40W)
HS21 XM Quad Core (7995)	5138 (355)	E5345 (80W/4c) E5440 (80W/4c) L5408 (40W/2c)
HS22 (7870) Intel® Xeon® 5500 series	-	E5540 (80W/4c) L5518 (60W/4c) L5508 (38W/2c)
HS22 (7870) Intel® Xeon® 5600 series	-	E5620 (80W/4c) E5645 (80W/6c) L5638 (60W/6c) L5618 (40W/4c)
HS22V (7871) Intel® Xeon® 5600 series	-	E5620 (80W/4c) E5645 (80W/6c) L5638 (60W/6c) L5618 (40W/4c)
LS22 (7901)	-	-
LS42 (7902)	-	8376 HE (55W)
JS12 (7998-60X)	-	-
JS22 (7998; except 60X)	-	P6 DC 4.0GHz
JS23/43 (7778-23x)	-	P6+ 4.2GHz
PS700/701/702 (8406-70Y/71Y)	-	P7 3.0GHz
PS703/704 (7891-73X/74X)	-	Planned 4Q'11
QS21 (0792)	-	-
QS22 (0793)	-	Cell BE 3.2GHz

Telco Blade Options

Table 76: HS22 Options that have been tested for NEBS3 and ETSI Compliance

Description	Part Number	Feature Code
Intel Xeon Processor L5518 4C 2.13GHz 8MB Cache 1066MHz 60W	49Y5050	0702
Additional Intel Xeon Processor L5518 4C 2.13GHz 8MB Cache 1066MHz 60W	49Y5051	7748
Intel Xeon Processor L5638 (6C 2.0 GHz 12MB 1333 MHz 60W)	68Y8130	0732
Additional Intel Xeon Processor L5638 (6C 2.0 GHz 12 MG 1333 MHz 60W)	68Y8124	7669
Intel Xeon Processor L5618 4C (1.86 GHz 8MB Cache 1066MHz 40W)	68Y8123	Special Bid Only
Additional Intel Xeon Processor L5618 4C (1.86 GHz 8MB Cache 1066MHz 40W)	68Y8123	Special Bid Only
Intel Xeon Processor E5620 4C 2.4 GHz 12MB 1066 MHz 80W	59Y5716	5378
Additional Intel Xeon Processor E5620 4C 2.4 GHz 12MB 1066 MHz 80W	59Y5705	7758
2GB (1Rx4 1 Gbit PC3L – 10600R VLP RDIMM 1.35V	46C0561	1907
4GB (2Rx4 1 Gbit PC3L – 10600R VLP RDIMM 1.35V	46C0567	1908
8GB 2Rx4 2 Gbit PC3L – 8500R VLP RDIMM 1.35V	46C0569	1909
2GB (2Gb,1Rx8,1.5V) PC3-10600R VLP RDIMM	44T1594	
2GB (2Gb,1Rx8,1.35V) DDR3-1333 VLP RDIMM	46C0560	
4GB (2Gb,1Rx4,1.35V) DDR3-1333 VLP RDIMM	46C0563	
4GB (2Gb,2Rx8,1.35V) DDR3-1333 VLP RDIMM	46C0564	
600 GB 10k 6 Gbps NL SAS 2.5" SFF Slim-HS HDD	49Y2003	5433
146 GB 10k 6 Gbps SAS 2.5" SFF Slin-HS HDD	42D0632	5537
73GB 15K SAS 2.5" SFF Slim-HS HDD	42D0672	5522
Ethernet Expansion Card CIOv	44W4475	1039
Emulex Virtual Fabric Adapter (CFFh)	49Y4235	5755
ServRAID-MR 10ie Adapter	46C7167	
Intel 10 Gb 2-port Ethernet Expansion Card	42C1810	3593
PCI Express I/O Expansion Unit	43W4391	
Pro/1000 PT Dual Port Ethernet Adapter by Intel	39Y6126	
NetXtreme II 1000 Express Ethernet Adapter	39Y6066	
IBM BladeCenter PCIe Gen 2 Expansion Blade	46M6730	

Table 77: HS22V Options that have been tested for NEBS3 and ETSI Compliance

Description	Part Number	Feature Code
Intel Xeon Processor E5645 6C 2.4 GHz 12MB 1333 MHz 80W	69Y4702	0731
Additional Intel Xeon Processor E5645 6C 2.4 GHz 12MB 1333 MHz 80W	69Y4744	7668
Intel Xeon Processor L5638 6C 2.00 GHz 12MB 1333 MHz 60W	69Y4704	0732
Additional Intel Xeon Processor L5638 6C 2.00 GHz 12MB 1333 MHz 60W	69Y4745	7669
2GB (1Rx4 1 Gbit PC3L – 10600R VLP RDIMM 1.35V	46C0561	3890
4 GB (2Rx4 1 Gbit PC3L – 10600R VLP RDIMM 1.35V	46C0567	3891
8GB (2Rx4 2 Gbit PC3L – 8500R VLP RDIMM 1.35V	46C0569	3892
2GB (2Gb,1Rx8,1.5V) PC3-10600R VLP RDIMM	44T1594	
2GB (2Gb,1Rx8,1.35V) DDR3-1333 VLP RDIMM	46C0560	
4GB (2Gb,1Rx4,1.35V) DDR3-1333 VLP RDIMM	46C0563	
4GB (2Gb,2Rx8,1.35V) DDR3-1333 VLP RDIMM	46C0564	
50 GB 1.8" SATA SSD	43W7734	5314
Ethernet Expansion Card CIOv	44W4475	5477
Intel 10 Gb 2-port Ethernet Expansion Card	42C1810	3593

Select BladeCenter related URLs

BladeCenter User's Guides for chassis, servers, and options - <http://www.redbooks.ibm.com/abstracts/tips0756.html>

BladeCenter Interoperability Guide -

<http://www.ibm.com/systems/support/supportsite.wss/docdisplay?Indocid=MIGR-5073016&brandind=5000020>

BladeCenter SAS RAID Module Interoperability Guide –

<http://www.ibm.com/support/entry/portal/docdisplay?Indocid=MIGR-5078491> Configurations and Options Guide (COG) - <http://www.ibm.com/systems/xbc/cog/>

System Storage Interoperation Center (SSIC) -

http://www.ibm.com/systems/support/storage/config/ssic/displayesssearchwithoutjs.wss?start_over=yes

Director - <http://www.ibm.com/systems/management/director/>

Electronic Service Agent (eSA) -

http://www.ibm.com/jct03004c/support/electronic/portal/!ut/p/kcxml/04_Sj9SPykssy0xPLMnMz0vM0Y_QjzKLt4y3dAXJgFku-pHllqbxjnCBIH1vfV-P_NxU_QD9gtzQiHJHR0UAHunMNw!!/delta/base64xml/L2dJQSEvUUt3QS80SVVFLzZfOV85RQ!!?category=5&locale=en_US

Power Calculation Tool - <http://www.ibm.com/systems/bladecenter/resources/powerconfig/index.html>

Redbooks – for BladeCenter - <http://www.redbooks.ibm.com/cgi-bin/searchsite.cgi?query=bladecenter>

ServerGuide - <http://www.ibm.com/systems/support/supportsite.wss/docdisplay?Indocid=SERV-GUIDE&brandind=5000008>

ServerGuide Scripting Toolkit - <http://www.ibm.com/systems/management/sgstk.html>

ServerProven - <http://www.ibm.com/servers/eserver/serverproven/compat/us/eserver.html>

Stand-alone Solutions Configuration Tool (SSCT) -

<http://www.ibm.com/systems/support/supportsite.wss/docdisplay?Indocid=MIGR-62168&brandind=5000008>

Techline System x Repository - IBM W3: <http://techlinelinuxshare.greenock.uk.ibm.com/index.shtml>

Partnerworld: <http://www.ibm.com/services/weblectures/techline>

WorkLoad Estimator (WLE) - <http://www.ibm.com/wle/EstimatorServlet>

xRef Sheets - <http://www.redbooks.ibm.com/Redbooks.nsf/pages/xref?Open>

IBM BladeCenter iSCSI BladeBoot™ - <http://www.ibm.com/systems/bladecenter/hardware/storage/iscsi.html>

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