

IBM System x Networking

Interoperability Guide

April 2012

Document Purpose: Quick reference for IBM System x Networking Interoperability.

Compliment to ServerProven, COG, and the Configuration tools.

This paper is intended to provide information regarding Networking 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, Juniper, Brocade, Cisco, Emulex, Broadcom or QLogic products.

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1GbE System x Networking Switches

	Juniper EX2200	IBM G8000	IBM G8052	IBM J48E (Juniper)
1Gb ports	24 or 48	44 RJ45 + 4 SFP	48	48
10Gb uplink ports - SFP+/CX4	None	2-4 optional Choice	4 standard SFP+	2 optional SFP+
Latency (microseconds)	3.25 μ s	4.6 μ s	1.8 μ s	1.96 μ s
Power (Watts)	91W	120W	130W	320W
Redundant Pwr Supply Hot-swap	No No	Standard No	Standard Yes	Optional Yes
Air-flow	Side-to-Rear	Front-to-Rear Rear-to-Front	Front-to-Rear Rear-to-Front	Side-to-rear
Virtualization - VMready	No	Yes	Yes	No
Virtual Chassis (128GB Backplane)	No	No	No	Yes
Stacking	No	Yes	Planned	Yes
Power over Ethernet	Select models	No	No	Yes (8 ports)
Rear Airflow Part # Front Airflow Part # DC Power Part #	See Footnote	0446013 7309CFC 7309CD8	7309G52 730952F	427348E
Web Price - Base - Redundancy (Pwr/Fans) - SFP+ Module - 10G SR-Transceivers	\$1,999 None None None	\$6,999 Standard \$995 2-port \$665	\$8,999 Standard Standard \$665	\$10,799 \$510 \$2,040 2-port \$1,530

Footnote

Juniper Networks EX2200 24 Port	6630010
Juniper Networks EX2200 24 Port with PoE	6630011
Juniper Networks EX2200 48 Port	6630012
Juniper Networks EX2200 48 Port with PoE	6630013

10GbE / 40GbE System x Networking Switches

	IBM G8124E	IBM G8264	IBM G8264T	Juniper EX4500	IBM G8316
10Gb	24 SFP+	48 SFP+ Up to 64 SFP+	48 10GBase-T (up to 16 SFP+)	40 SFP+ Up to 48 SFP+	Up to 64 via break out cables
40Gb	No	4 std QSFP+	4 std QSFP+	Planned 2H11	16 std QSFP+
Latency (microseconds)	0.57µs	0.88µs	3.2µs	2.7µs	0.8µs
Power – watts	115-168W	275W	385W	328 W	330W
Redundant Pwr Supply	Standard	Standard	Standard	Optional	Standard
Hot-swap	No	Standard	Standard	Yes	Standard
Air-flow	Front-to-Rear Rear-to-Front	Front-to-Rear Rear-to-Front	Front-to-Rear Rear-to-Front	Front-to-Rear Rear-to-Front	Front-to-Rear Rear-to-Front
Virtualization					
- VMready™	Yes	Yes	Yes	No	Yes
- Virtual Fabric™	Yes	Yes	No	No	Yes
DCB/CEE	Yes	Yes	Yes	Yes	Yes
Stacking	No	Planned	Planned	Yes (Virtual Chassis)	Planned
Rear Airflow Part #	7309BR6	7309G64	7309CR9	0719410	8036-ARX
Front Airflow Part #	7309BF7	730964F	7309CF9	0719420	8036-AFX
DC Power Part #	7309BD5				
Web Price					
- Base	\$14,999	\$ 29,999	\$ 24,999	\$ 30,179	\$35,999
- Redundancy (Pwr & Fans)	Standard	Standard	Standard	\$1,499	Standard
- 10G SR Trans	\$665	\$665	NA	\$1,499	NA

System x Networking Cables

IBM System x Networking Cables			IBM G8000	IBM G8052	IBM G8124E	IBM G8264	IBM G8264T	IBM G8316	IBM J48E	Juniper EX2200	Juniper EX4500
RJ45	0.6m Blue Cat5e Cable	40K5679	44	48					48	24 or 48	
	1.5m Blue Cat5e Cable	40K8785									
	3m Blue Cat5e Cable	40K5581									
	10m Blue Cat5e Cable	40K8927									
	25m Blue Cat5e Cable	40K8930									
	Industry Standard Cat 6 & 6A Cables	NA									
Active DAC	1m 10GE Twinax Act Copper SFP+	81Y8295									
	3m 10GE Twinax Act Copper SFP+	81Y8296									
	5m 10GE Twinax Act Copper SFP+	81Y8297									
Passive DAC Cables	SFP+ 10 GbE Passive DAC 1m (Juniper Twinax Copper Cable)	68Y6927									48
	SFP+ 10 GbE Passive DAC 3m (Juniper Twinax Copper Cable)	68Y6947									
	SFP+ 10 GbE Passive DAC 7m (Juniper Twinax Copper Cable)	68Y6999									
	1m IBM Passive DAC SFP+ Cable	90Y9427									
	3m IBM Passsive DAC SFP+ Cable	90Y9430									
	5m IBM Passive DAC SFP+ Cable	90Y9433									
	8.5m IBM Passive DAC SFP+ Cable	90Y9436									
Optical Cables	1m LC-LC Fiber Cable (networking) - Optical	88Y6851	4	4	24	48					
	5m LC-LC Fiber Cable (networking)- Optical	88Y6854							2	4	48
	25m LC-LC Fiber Cable (networking) - Optical	88Y6857									
	10m IBM QSFP+ MTP Optical cable	90Y3519				4	4	16			
	30m IBM QSFP+ MTP Optical cable	90Y3521									

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IBM System x Networking Cables			IBM G8000	IBM G8052	IBM G8124E	IBM G8264	IBM G8264T	IBM G8316	IBM J48E	Juniper EX2200	Juniper EX4500
Virtual Ch Cables	1M EX4200/EX4500 128G Virtual Chassis Port cable 1M	88Y6890									2
	3M EX4200/EX4500 128G Virtual Chassis Port cable 3M	88Y6894									
	5M EX4200/EX4500 128G Virtual Chassis Port cable 5M	88Y6898									
	.5M EX4200/EX4500 128G Virtual Chassis Port cable .5M	88Y6863									
	VC Cable 1 Meter	45W5961									
	VC Cable 3 Meter	45W5962							2		
	VC Cable 5 Meter	45W5963									
QSFP Cables	1m IBM QSFP+ to QSFP+ Cable	49Y7890									
	3m IBM QSFP+ to QSFP+ Cable	49Y7891									
	5m IBM QSFP+ to QSFP+ Cable	00D5810									
	7m IBM QSFP+ to QSFP+ Cable	00D5813				4	4	16			
QSFP to 10Gbe Cables	1m IBM QSFP+ DAC Break Out Cable	49Y7886									
	3m IBM QSFP+ DAC Break Out Cable	49Y7887									
	5m IBM QSFP+ DAC Break Out Cable	49Y7889									

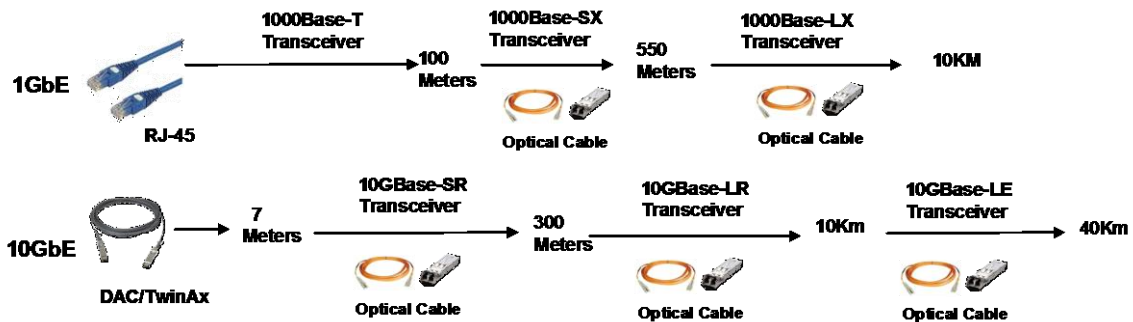
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System x Networking Transceivers

		IBM G8000 / G8052	IBM G8124E	IBM G8264	IBM G8264T	IBM G8316	IBM J48E	Juniper EX2200	Juniper EX4500
IBM SFP RJ45 Transceiver ¹	81Y1618	4	24	48					
IBM SFP SX Transceiver ²	81Y1622								
IBM SFP LX Transceiver ³	90Y9424								
IBM SFP+ SR Transceiver ⁴	46C3447								
IBM SFP+ LR Transceiver ⁵	90Y9412								
IBM SFP+ ER Transceiver ⁶	90Y9415								
IBM QSFP+ 40GBASE-SR Transceiver ¹	49Y7884			4	4	16			
1GE Copper RJ-45 100m SFP ¹	45W4475						2		
10GbE SR SFP+ Transceiver (Juniper) ⁴	45W4743								
10GE LR 10km SFP+ ⁵	45W4744								
SFP 1000B-SX GbE 850nm 550m ²	45W4739								
1000B-LX GbE 1310nm 10km SFP ³	45W4740								
1GE Copper RJ-45 100m SFP ¹	88Y6833							48	
1000B-LX GbE 1310nm 10km SFP ³	88Y6839								
1000B-SX GbE 850nm 550m SFP ²	88Y6836								
10GE Short Reach 850nm 300m SFP+ on MM fiber ⁴	68Y6923								
10GE Long Reach 1310nm 10km SFP+ ⁵	88Y6877							48	

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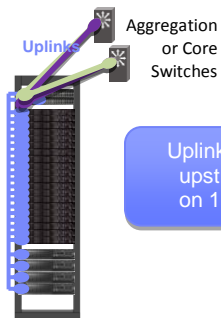
- Note 1** RJ 45 SFP Transceiver = 1Gb up to 100m
- Note 2** SX SFP Transceiver = 1Gb at 100m up to 550m
- Note 3** LX SFP Transceiver = 1Gb at 550m up to 10km
- Note 4** SR SFP+ Transceiver = 10Gb at 7m up to 300 Meters
- Note 5** LR SFP+ Transceiver = 10Gb at 300m up to 10KM
- Note 6** ER SFP+ Transceiver = 10Gb at 10KM up to 40KM
- Note 7** SR QSFP+ Transceiver = 40Gb at 7m up to 300 Meters
- Note 7** ALL Transceivers (except RJ45) must be ordered with optical cables



System x Networking Uplinks

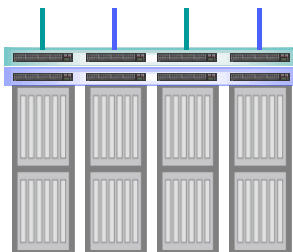
		IBM G8000	IBM G8052	IBM G8124E	IBM G8264	IBM G8264T	IBM G8316	IBM J48E	Juniper EX2200	Juniper EX4500
IBM RackSwitch 10Gb Dual-port SFP+ Uplink Module	46C3417	Y								
IBM RackSwitch 10Gb Dual-Port CX4 Uplink Module	46C3421	Y								
EX4500 4-Port 10G SFP+ Uplink Module	81Y8287									1
Exx Uplink Module 2x10G / 4x1G	45W4453							1		
4GB Uplink Module	45W4876									

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Uplinks provide 10Gb upstream connection on 1Gb Switches

Uplink Usage #1: Connection to Upstream Switches



Stacking allows multiple switches to be connected to create one large virtual / logical switch

Uplink Usage #2: Stacking Multiple Switches

Notes:

Note 1 Uplinks standard on IBM G8052. Stacking available in future.

Note 2 Uplinks not available on EX2200

System x Networking Power Supplies

		IBM G8000	IBM G8052	IBM G8124E	IBM G8264	IBM G8264T	IBM G8316	IBM J48E	Juniper EX2200	Juniper EX4500
EX4500 power supply-front to back airflow,	81Y8285									1
EX4500 power supply-back to front airflow	81Y8286									1
J48E Power Supply	45W4437							1		

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Notes:

Note 1 Optional Power Supply not available on EX2200

Note 2 All IBM Networking Switches come standard with Dual Power Supplies

System x Networking Power Cords

		IBM G8000	IBM G8052	IBM G8124E	IBM G8264 / G8264T	IBM G8316	IBM J48E	Juniper EX2200	Juniper EX4500
Power Cord Europe	39Y7917	Y	Y	Y	Y	Y		Y	
Power Cord Europe	39Y7918	Y	Y	Y	Y	Y			
Power Cord Europe	39Y7919	Y	Y	Y	Y	Y		Y	
Power Cord Europe	39Y7920	Y	Y	Y	Y	Y			
Power Cord Europe	39Y7922	Y	Y	Y	Y	Y			
Power Cord UK	39Y7923	Y	Y	Y	Y	Y		Y	
Power Cord Austrila	39Y7924	Y	Y	Y	Y	Y			
Power Cord Korea	39Y7925	Y	Y	Y	Y	Y		Y	
Power Cord Japan	39Y7926	Y	Y	Y	Y	Y			
Power Cord India	39Y7927	Y	Y	Y	Y	Y			
Power Cord China	39Y7928	Y	Y	Y	Y	Y		Y	
Power Cord Brazil	39Y7929	Y	Y	Y	Y	Y			
Power Cord Uruguay / Argentina	39Y7930	Y	Y	Y	Y	Y			
Power Cord US / Canada	39Y7931	Y		Y				Y	
Power Cord Italy / Chile	39Y7921							Y	
Power Cord US / Canada	46M2592		Y		Y	Y			
Power Cord Japan	46M2593		Y		Y	Y			
4.3m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	39Y7932	Y	Y	Y	Y	Y	Y	Y	
1.5m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	39Y7937	Y	Y	Y	Y	Y	Y		
2.8m, 10A/100-250V, C13 to IEC 320-C20 Rack Power Cable	39Y7938	Y				Y		Y	
AC Power Cable - Australia (15A/250V, 2.5m)	88Y6905								Y
AC Power Cable - China (16A/250V, 2.5m)	88Y6909								Y
AC Power Cable - EU (16A/250V, 2.5m)	88Y6913								Y
AC Power Cable - Italy (16A/250V, 2.5m)	88Y6917								Y
AC Power Cable - Japan Locking (16A/250V, L6-20, 2.5m)	88Y6921								Y
AC Power Cable - Korea/EU (16A/250V, 2.5m)	88Y6925								Y
AC Power Cable - Switzerland (16A/250V, 2.5m)	88Y6929								Y
AC Power Cable - UK (13A/250V, 2.5m)	88Y6933								Y
AC Power Cable - US (15A/125V, NEMA 5-15, 2.5m)	88Y6937								Y
AC Power Cable - Argentina (16A/250V, 2.5m)	88Y6941								Y
AC Power Cable - Brazil (16A/250V,2.5m)	88Y6945								Y
AC Power Cable - India (16A/250V, 2.5m)	88Y6949								Y
AC Power Cable - Israel (16A/250V, 2.5m)	88Y6953								Y
AC Power Cable - South Africa (16A/250V, 2.5m)	88Y6957								Y

Note: All Networking Switches should be ordered with 2 AC Power Cables (except EX2200 = 1)

System x Networking Power Cords (continued)

		IBM G8000	IBM G8052	IBM G8124E	IBM G8264 / G8264T	IBM G8316	IBM J48E	Juniper EX2200	Juniper EX4500
AC Power Cable - Taiwan (16A/250V, 2.5m)	88Y6961								Y
Exx Power Cable, Australia	45W4599						Y		
Exx Power Cable, China	45W4600						Y		
Exx Power Cable, Europe	45W4601						Y		
Exx Power Cable, Italy	45W4602						Y		
Exx Power Cable, UK	45W4603						Y		
Exx Power Cable, US/Japan	45W4604						Y		

Note: All Networking Switches should be ordered with 2 AC Power Cables (except EX2200 = 1)

System x Networking Additional Options

		IBM G8000	IBM G8052	IBM G8124E	IBM G8264	IBM G8264T	IBM G8316	IBM J48E	Juniper EX2200	Juniper EX4500
E48 Switch Adv Features	45W4573							1		
Juniper Advance Features (Layer 3)	88Y6887									1
EX4500 4-post rack mount kit for iDataPlex	95Y0356									1
EX4500 4-post rack mount kit (supports IC 1410)	81Y8298									1
19" Flexible 4 Post Rail Kit (System x)	49Y4284	1	1	1	1	1	1			
Rack Kit	45W5960							1		
Hot-Swappable, Rear-to-Front Fan Assembly Spare	88Y6026		2		2	2	2			
Hot-Swappable, Front-to-Rear Fan Assembly Spare	49Y7939		2		2	2	2			
Hot-Swappable, Rear-to-Front Power Supply Spare	49Y7938		2		2		2			
Hot-Swappable, Front-to-Rear Power Supply Spare	49Y7937		2		2		2			
Hot-Swappable, Rear-to-Front Power Supply Spare	00D5857					2				
Hot-Swappable, Front-to-Rear Power Supply Spare	00D5858					2				
Console Cable Kit Spare	90Y9462		2		2	2	2			

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System x Networking Virtual Fabric Support

	VFAII PCI-E		VFAIII Mezz		VFAIII PCI-E	
	49Y7950		90Y6456		95Y3762	
	G8124E	G8264	G8124E	G8264	G8124E	G8264
IBM System x3100 M4					5/31	5/31
IBM System x3250 M4					5/31	5/31
IBM System x3500 M4					vNIC1	vNIC1
IBM System x3550 M4			vNIC1&2	vNIC1&2	vNIC1	vNIC1
IBM System x3650 M4			vNIC1&2	vNIC1&2	vNIC1	vNIC1
IBM System x3200 M3	vNIC1	vNIC1&2				
IBM System x3250 M3	vNIC1	vNIC1&2				
IBM System x3400 M3	vNIC1	vNIC1&2				
IBM System x3500 M3	vNIC1	vNIC1&2				
IBM System x3550 M3	vNIC1	vNIC1&2				
IBM System x3620 M3	vNIC1	vNIC1&2				
IBM System x3630 M3	vNIC1	vNIC1&2				
IBM System x3650 HF M3						
IBM System x3650 M3	vNIC1	vNIC1				
IBM System x3755 M3						
IBM System x3690 X5	vNIC1	vNIC1				
IBM System x3850 X5	vNIC1	vNIC1				

Note: These supported configurations are based on the version of Virtual Fabric that leverages the IBM Networking OS (Network Operating System) leveraged on the IBM System Networking products. These VFA solutions allow carving up at both the adapter and the switch side to create virtual pipes between the two. By being able to isolate vNIC's clients can have better security between vNIC's, in addition to maximize performance and availability of each vNIC. This approach also allows for dynamic bandwidth allocation with no down time and simpler management by being able to manage vNIC's in groups and making things transparent to upstream networking devices.

System x Server Ethernet Chipset & Ports

System x Server	Ethernet Chipset	Standard Ports
IBM System x3200 M3	Intel 82574L chip	2
IBM System x3250 M3	Intel 82574L chip	2
IBM System x3400 M3	Broadcom BCM5709C	2
IBM System x3500 M3	Broadcom BCM5709C	2
IBM System x3550 M3	Broadcom BCM5709	2
IBM System x3620 M3	Intel 82575	2
IBM System x3630 M3	Intel 82575	2
IBM System x3650 HF M3	Broadcom BCM5709	2
IBM System x3650 M3	Broadcom BCM5709	2
IBM System x3755 M3	Broadcom BCM5709C	2
IBM System x3690 X5	Broadcom BCM5709C	2
IBM System x3850 X5	Broadcom BCM5709C	2
IBM System x3100 M4	Intel 82574L chip	2
IBM System x3250 M4	Intel 82574L chip	2
IBM System x3500 M4	Intel I350AM4	4
IBM System x3550 M4	Intel I350AM4	4
IBM System x3650 M4	Intel I350AM4	4

IBM System Networking – RackSwitch G8264/ G8264T/G8316 40Gb Usage Scenarios

Usage Scenario #1: For 40Gb-to-40Gb connectivity, clients can use QSFP+ Direct Attach Cables up to 7 meters.



40Gb Networking Switch



- 1m IBM QSFP+-to-QSFP+ Cable, (49Y7890)
- 3m IBM QSFP+-to-QSFP+ Cable, (49Y7886)
- 5m IBM QSFP+-to-QSFP+ Cable (00D5810)
- 7m IBM QSFP+-to-QSFP+ Cable (00D5813)

Usage Scenario #2: For 40Gb connectivity over longer distances, use a QSFP+ transceiver and QSFP+ MTP optical cables to connect to 40Gb



40GBase-SR4
Transceiver
(49Y7884)



Transceiver + 40Gb Networking Switch

- 10m IBM QSFP+ MTP Optical cable (90Y3519)
- 30m IBM QSFP+ MTP Optical cable (90Y3521)

Usage Scenario #3: Increase the number of available 10Gb ports, use QSFP+ DAC Break Out Cables to split out each 40Gb port and connect up to four 10Gb SFP+ external ports using copper.



10Gb Networking Switch

- QSFP+ DAC Break Out Cable, 1M (49Y7886)
- QSFP+ DAC Break Out Cable, 3M (49Y7887)
- QSFP+ DAC Break Out Cable, 5M (49Y7886)

or

10Gb Server
Adapter

System X Networking Adapters – Supported Switches

		IBM G8000	IBM G8052	IBM G8124E	IBM G8264	IBM G8264T	IBM J48E	Juniper EX2200	Juniper EX4500	
10GbE	Emulex 10GbE Virtual Fabric Adapter I for IBM System x	49Y4250	Y	Y	Y	Y		Y	Y	Y
	Emulex 10GbE Virtual Fabric Adapter II for IBM System x	49Y7950	Y	Y	Y	Y		Y	Y	Y
	Emulex 10GbE Virtual Fabric Adapter III for IBM System x	95Y3762	Y	Y	Y	Y		Y	Y	Y
	Broadcom NetXtreme II Dual Port 10G BaseT Adapter for IBM System x	49Y7910	Y	Y			Y	Y	Y	
	Intel x520 Dual Port 10GbE SFP+ Adapter for IBM System x	49Y7960	Y	Y	Y	Y		Y	Y	Y
	Mellanox ConnectX-2 Dual Port 10GbE Adapter for IBM System x	81Y9990	Y	Y	Y	Y		Y	Y	Y
10Gb Mezz	Emulex Dual Port 10GbE SFP+ Embedded VFA III for IBM System x	90Y6456	Y	Y	Y	Y		Y	Y	Y
CNA	Qlogic 10Gb CNA for IBM System x	42C1800						Y	Y	Y
	Brocade 10Gb CNA for IBM System x	42C1820						Y	Y	Y
Feature on Demand	Emulex VFA II FCoE/iSCSI License for IBM System x (FoD) <i>Use with 49Y7950</i>	49Y4274	Y	Y	Y	Y		Y	Y	Y
	Emulex VFA III FCoE/iSCSI License for IBM System x (FoD) <i>Use with 95Y3762</i>	95Y3760	July	July	July	July		July	July	July
	Emulex Embedded VFA III FCoE/iSCSI License for IBM System x (FoD) – <i>Use with 90Y6456</i>	90Y5178	July	July	July	July		July	July	July
1Gb Single	PRO/1000 PF Server Adapter (Single Port)	42C1750	Y	Y	Y	Y		Y	Y	Y
	IBM xSeries NetXtreme II 1000 Express Ethernet Adapter (Single Port)	39Y6066	Y	Y	Y	Y		Y	Y	Y
1Gb Dual	NetXtreme II 1000 Express Dual Port Ethernet Adapter	42C1780	Y	Y	Y	Y		Y	Y	Y
	Broadcom NetXtreme I Dual Port GbE Adapter for IBM System x	90Y9352	Y	Y	Y	Y		Y	Y	Y
	Intel Ethernet Dual Port Server Adapter I340-T2 for IBM System x	49Y4230	Y	Y	Y	Y		Y	Y	Y
1Gb Quad	NetXtreme II 1000 Express Quad Port Ethernet Adapter	49Y4220	Y	Y	Y	Y		Y	Y	Y
	Broadcom NetXtreme I Quad Port GbE Adapter for IBM System x	90Y9370	Y	Y	Y	Y		Y	Y	Y
	Intel Ethernet Quad Port Server Adapter I340-T4 for IBM System x	49Y4240	Y	Y	Y	Y		Y	Y	Y

IBM System x 1GbE Networking Adapters Product Portfolio

IBM System x 1GbE Adapters	Intel 1GbE Base-T Adapter for IBM System x	Intel 1GbE SR Fiber Adapter for IBM System x	Broadcom NetXtreme I Base-T 1GbE Adapters	Broadcom NetXtreme II Base-T 1GbE Adapters
IBM Product Number	2 Port: 49Y4230	1 Port: 42C1750	2 Port: 90Y9370R	1 Port: 39Y6066
	4 Port: 49Y4240		4 Port: 90Y9352	2 Port: 42C1780
				4 Port: 49Y4220
Solution	Full Feature LAN	Value LAN	Full Feature LAN	Full Feature LAN
		1000 Base-X SR Fiber		
ASIC	Intel 82580	Intel 82572GI	2 Port: BRCM 5720 4 Port: BRCM 5719	Broadcom BCM5709
Bus Type	PCIe Gen2	PCIe 1, compatible with x4, x8, and x16	PCIe Gen2	PCIe Gen2
Connector / Cable Type	RJ45 CAT 5	Integrated SR Optic, LC/LC	RJ45 CAT 5	RJ45 CAT 5
iSCSI HW/SW*	iSCSI SW Boot / Initiators		iSCSI SW Boot / Initiators	iSCSI SW Boot / Initiators
Unique Features	802.1 Q – 4096 VLANs	Integrated SR Fiber Transceiver	IEEE 802.3az-2010 EEE	
	802.1p		1588 HW assist Precision Timing Control	
	1588 Precision Timing Control			
Accelerated iSCSI capable				Y
TCP/IP Offload	Y			Y
Receive Side Scaling (RSS)	Y	Y	Y	Y
Pre-boot execution environment	Y		Y	Y
Wake-on-LAN	Y		Y	Y
Jumbo Frames	Y		Y	Y
Checksum Offload	Y		Y	Y
802.1Q VLAN	Y		Y	Y
802.1p QOS	Y		Y	
802.3x Flow Control	Y		Y	Y
802.3ad Link aggregation	Y			Y
IEEE 1588 Precision Time Control	Y		Y	
VMDq / NetQue	Y		Y	Y
iSCSI Initiators	Y		Y	Y
iSCSI Boot	Y		Y	Y

IBM System x 10 GbE Networking Adapters Product

IBM System x 10GbE Adapters	Intel X520 Dual Port 10GbE SFP+ Adapter	Emulex 10GbE Virtual Fabric Adapter II	Emulex 10GbE Virtual Fabric Adapter III	Mellanox CX-2 Dual Port 10GbE Adapter	Broadcom NetXtreme II Dual Port 10GBaseT
IBM Product Number	49Y7960	49Y7950	95Y3762	81Y9990	49Y7910
ASIC	82599	BE3	BE3	CX2	BCM57712
Ports and Speed	2x10 GbE	2x10 GbE	2x10 GbE	2x10 GbE	2x 10 GbE
Bus Type	PCIe Gen2	PCIe Gen2	PCIe Gen2	PCIe Gen2	PCIe Gen2
Connector / Cable Type	SFP+ & DAC	SFP+ & DAC	SFP+ & DAC	SFP+ & DAC	RJ45
					CAT 5e – GbE
					CAT 6a/7 – 10 GbE
iSCSI	iSCSI SW Boot / initiators	iSCSI SW Initiators Included	iSCSI SW Initiators Included		iSCSI SW Boot / Initiators
		iSCSI HW Offload requires Opt SW	iSCSI HW Offload requires Opt SW		
Unique Features	VMDq (Virtualization)	VFA (vNIC/Speed)	VFA (vNIC/Speed)	RDMA	RJ45 10GBase-T
	VM Load Balancing	Switch Agnostic vNIC	Switch Agnostic vNIC	1 us latency	BACS MGT
	Round Robin MSI/MSI-X Queuing	FCoE/iSCSI License (optional)	FCoE/iSCSI License (optional)		
	IPSec Offload Engine	One MGT NIC/HBA	One MGT NIC/HBA		
	I/OAT-Direct Cache	vEngine Virtualization	vEngine Virtualization		
Accelerated iSCSI capable		Y	3Q12		Y
TCP/IP Offload (TOE)	Y	Y	Y	Y	Y
Receive Side Scaling (RSS)	Y	Y	Y		Y
Pre-boot execution environment	Y	Y	Y	Y	Y
Wake-on-LAN					
Jumbo Frames	Y	Y	Y	Y	Y
Checksum Offload	Y	Y	Y		Y
802.1Q VLAN	Y	Y	Y	Y	Y
802.1p QOS	Y	Y	Y	Y	Y
802.3x Flow Control	Y	Y	Y	Y	Y
802.3ad Link aggregation	Y	Y	Y	Y	Y
IEEE 1588 Precision Time Control					
VMDq / VMQue / NetQue	Y	Y	Y		Y
Teaming		Y	Y		Y

IBM System x Converged Network Adapters

IBM System x C.N.A.	Emulex 10GbE Virtual Fabric Adapter II Adapter	Emulex 10GbE Virtual Fabric Adapter III	Qlogic 10Gb CNA for IBM System x	Brocade 10Gb CNA for IBM System x
IBM Product Number	Adapter: 49Y7950	95Y3762	42C1800	42C1820
	iSCSI/FCoE License: 49Y7274	iSCSI/FCoE License: Roadmap 3Q12		
Solution	2x 10 Gb Ethernet (see 10 GbE chart for list of features)	2x 10 Gb Ethernet	FCoE	FCoE
	2x 10 Gb FCoE		2x Ports	2x Ports
	2x 10 Gb iSCSI w/HW Offload	2x 10 Gb iSCSI SW Initiator		Ethernet
Network Controller	BE3	BE3	8100	1050
Bus Type	PCIe Gen2	PCIe Gen2	PCIe Gen2	PCIe Gen2
Connector / Cable Type	SFP+, Optical & DAC	SFP+, Optical & DAC	SFP+, Optical & DAC	SFP+, Optical & DAC
Virtual Fabric (vNIC)*	Yes	Yes	No	No
Virtual Ports	2-8	2-8	NA	NA
iSCSI HW/SW*	iSCSI SW Initiators Included	iSCSI SW Initiators Included	No	No
	iSCSI HW Offload requires Opt SW License	3Q12		
FCoE*	Yes. Requires Opt SW License	3Q12	Yes - HW Offload	Yes - HW Offload

* Check SSIC for supported configurations

System X Networking Adapters – Supported Transceivers

			IBM SFP+ SR Transceiver (46C3447)	Brocade 10 Gigabit SFP+ SR Transceiver (49Y4216)	QLogic 10 Gigabit SFP+ SR Transceiver (49Y4218)
10GbE	Emulex 10GbE Virtual Fabric Adapter I for IBM System x	49Y4250	Y	Y	Y
	Emulex 10GbE Virtual Fabric Adapter II for IBM System x	49Y7950	Y	Y	Y
	Emulex 10GbE Virtual Fabric Adapter III for IBM System x	95Y3762	Y	Y	Y
	Emulex Dual Port 10GbE SFP+ Embedded Virtual Fabric Adapter III for IBM System x	90Y6456	Y	Y	Y
	Intel X520 Dual Port 10GbE SFP+ Adapter for IBM System x	49Y7960	Y	Y	Y
	Broadcom NetXtreme II Dual Port 10G BaseT Adapter for IBM System x	49Y7910	RJ45	RJ45	RJ45
	Mellanox ConnectX-2 Dual Port 10GbE Adapter for IBM System x	81Y9990	Y	Y	Y
CNA	Qlogic 10Gb CNA for IBM System x	42C1800			Y
	Brocade 10Gb CNA for IBM System x	42C1820		Y	

Note: IBM 10 Gigabit Ethernet Software (SW) SFP+ Transceiver (49Y8578) is iDataPlex only (not orderable as System x Option)

System x Networking Adapters – Supported DAC Cables (Active / Passive)

System x 10GbE Networking Adapters	IBM Part #	IBM G8124E IBM G8264	Juniper EX4500
Emulex 10GbE Virtual Fabric Adapter I for IBM System x	49Y4250	1M (P) 90Y9427 3M (P) 90Y9430 5M (P) 90Y9433	1M (A) 81Y8295 3M (A) 81Y8296 5M (A) 81Y8297 1M (P) 68Y6927 3M (P) 68Y6947 5M (P) 68Y6999
Emulex 10GbE Virtual Fabric Adapter II for IBM System x	49Y7950		
Emulex 10GbE Virtual Fabric Adapter III for IBM System x	95Y3762		
Emulex Dual Port 10GbE SFP+ Embedded Virtual Fabric Adapter III for IBM System x	90Y6456		
Broadcom NetXtreme II Dual Port 10G BaseT Adapter for IBM System x	49Y7910		
Intel x520 Dual Port 10GbE SFP+ Adapter for IBM System x	49Y7960		
Mellanox ConnectX-2 Dual Port 10GbE Adapter for IBM System x	81Y9990		
Qlogic 10Gb CNA for IBM System x	42C1800	NA	1M (A) 81Y8295 3M (A) 81Y8296 5M (A) 81Y8297
Brocade 10Gb CNA for IBM System x	42C1820		

Cables Supported: (P) = Passive Cables / (A) = Active Cables

IBM System x Networking Adapter Compatibility

Latest ServerProven Updates at: <http://www-03.ibm.com/systems/info/x86servers/serverproven/compat/us/xseries/lan/matrix.html>

FCoE Configuration Matrix

CNA Adapter / LOM / Mezz	Brocade CNA (1020)	Qlogic CNA (QLE8142)	Emulex VFA II (BE3)
IBM Part #	42C1820	42C1800	49Y7950
ASIC	1050	8124	BE3
FCoE Transit	NA	NA	NA
FCoE Gateway	Brocade B32	Cisco Nexus 5010 / 5020	Cisco Nexus 5010 / 5020
vNIC / pNIC	Today (no vNIC)	Today (no vNIC)	vNIC2
Ethernet + FCoE	Today	Today	Today
SAN Fabric	Brocade	Cisco	Cisco
DS3000		Y	Y
DS5000		Y	Y
V7000	Y		
SVC	Y	Y	
DS8000		Y	Y
XIV	Y	Y	
Tape			
Window 2008 R2 SP1 w/ Hyper V	Y	Y	
Red Hat Enterprise Linux 5/6	Y	Y	Y
Red Hat Enterprise Linux 5/6 with KVM	Y	Y	Y
SuSE Linux Enterprise Server (SLES) 11 SP1	Y	Y	
VM Ware ESXi5	Y	Y	

Not all configurations supported by IBM. Reference System Storage Interoperation Center (SSIC) for full listing of IBM supported FCoE & iSCSI Configurations

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

iSCSI Supported Configuration Matrix

Adapter	Part #	iSCSI Enabled*	Ethernet Switch	DS3K	DS5K	XIV
Emulex 10GbE Virtual Fabric Adapter I	49Y4250	SW = Yes	IBM G8000 G8052 G8124E G8264 G8316 Juniper J48E EX2200 EX4500	Yes	Yes	Yes
Emulex 10GbE Virtual Fabric Adapter II	49Y7950	SW = Yes		Yes	Yes	Yes
		HW		2Q12	2Q12	2Q12
Emulex 10GbE Virtual Fabric Adapter III	95Y3762	SW = Yes		Yes	Yes	Yes
Emulex 10GbE Virtual Fabric Adapter III Embedded	90Y6456	SW = Yes		Yes	Yes	Yes
Broadcom NetXtreme II Dual Port 10G BaseT Adapter	49Y7910	SW = Yes		Yes	Yes	Yes
Intel x520 Dual Port 10GbE SFP+ Adapter	49Y7960	SW = Yes		Yes	Yes	Yes
NetXtreme I 1000 Express Quad Port Ethernet Adapter	90Y9370	SW = Yes		Yes	Yes	Yes
NetXtreme II 1000 Express Quad Port Ethernet Adapter	49Y4220	SW = Yes		Yes	Yes	Yes
Intel Ethernet Quad Port Server Adapter I340-T4	49Y4240	SW = Yes		Yes	Yes	Yes
NetXtreme I 1000 Express Dual Port Ethernet Adapter	90Y9352	SW = Yes		Yes	Yes	Yes
NetXtreme II 1000 Express Dual Port Ethernet Adapter	42C1780	SW = Yes		Yes	Yes	Yes
Intel Ethernet Dual Port Server Adapter I340-T2	49Y4230	SW = Yes	Yes	Yes	Yes	

Note:

1. All IBM System x 1Gb & 10Gb adapters will support SW iSCSI Initiator
2. All IBM System x Networking switches support SW iSCSI
3. iSCSI HW offload is planned with IBM Virtual Fabric II Adapter (2Q)
4. IBM tested Configurations with OS and IBM Storage target support

*** Not all configurations supported by IBM. Reference System Storage Interoperation Center (SSIC) for full listing of IBM supported FCoE & iSCSI Configurations**
<http://www-03.ibm.com/systems/support/storage/ssic/interoperability.wss>

System x Networking Reference Material

Rackswitches

System x Networking Website	Link
SSI Website	Link
Configuration and Options Guide	Link
IBM RackSwitch G8000 At a Glance Guide	Link
IBM RackSwitch G8052 At a Glance Guide	Link
IBM RackSwitch G8124E At a Glance Guide	Link
IBM RackSwitch G8264 / G8264T At a Glance Guide	Link
IBM System Networking RackSwitch 8316 At a Glance Guide	Link
Juniper EX2200 At a Glance Guide	Link
IBM Ethernet Switch J48E At a Glance Guide	Link
Juniper EX4500 At a Glance Guide	Link

Adapters

Emulex 10GbE Virtual Fabric Adapter II for IBM System x AAGG	Link
Broadcom NetXtreme II Dual Port 10G BaseT Adapter for IBM System x AAGG	Link
Mellanox ConnectX-2 Dual Port 10GbE Adapter At a Glance Guide	Link
Mellanox ConnectX-2 Dual Port QSFP QDR IB Adapter for IBM System x AAGG	Link
Qlogic 10Gb CNA for IBM System x At a Glance Guide	Link
Brocade 10Gb CNA for IBM System x At a Glance Guide	Link
IBM xSeries NetXtreme II 1000 Express Ethernet Adapter (Single Port) AAGG	Link
NetXtreme II 1000 Express Dual Port Ethernet Adapter At a Glance Guide	
NetXtreme II 1000 Express Quad Port Ethernet Adapter AAGG	
PRO/1000 PF Server Adapter (Single Port) AAGG	Link
Intel Ethernet Dual Port Server Adapter I340-T2 AAGG	
Intel Ethernet Quad Port Server Adapter I340-T4 AAGG	

System X Servers

Rack Servers At a Glance Guides	x3250 M4 , x3250 M3 , x3550 M3 , x3620 M3 , x3630 M3 , x3650 M3
Tower Servers At A Glance Guides	x3100 M4 , x3200 M3 , x3400 M3 , x3500 M3

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